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OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

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OCTOBER, 1907.

No. 1.

Original Articles.

OPHTHALMOSCOPIC APPEARANCES IN CHRONIC CYANOTIC POLYCYTHEMIA.*

EDWARD JACKSON, M.D.

DENVER.

[Illustrated.]

A disease most strikingly affecting the veins and the constitution of the blood should, in every case, be carefully studied with the ophthalmoscope. To place on record a case in which the ophthalmoscopic appearances were observed over a longer period than in previously reported cases, and in which symptoms not previously described were noted, and to call attention to the significance of the retinal symptoms of cyanotic polycythemia, is the purpose of this paper.

Mrs. M., aged 60, a Jewess, born in Germany, mother of six children, consulted me Aug. 21, 1901, on account of indefinite blurring of sight, the letters running together after reading a short time, and for epiphora, the eye frequently filling with water, although tears did not often run over the lids.

For years "she has suffered from heart disease" (palpitation and dyspnea) and "overloaded veins." Her lips are purple (grape color), there are small varices on the cheeks, and passive hyperemia of the conjunctiva. The lids are not displaced and the lacrimal passages are normal. The dioptric media are clear; the retinal veins very large, dark and tortuous, double the size of the arteries, which are normal. No other fundus lesion. Vision: R. with — 0.50 cy., axis 180°, equal 4/vi partly; L. 4/xx, not improved with any lens; low myopia. Both eyes present a constant, slight, rather slow rotary nystagmus. Prescribed lenses for near work.

1902, April 24.—She comes for passive congestion of the conjunctival vessels. The pupils are now unequal, the right being 5 mm., the left 4 mm., in moderate light. Vision has decreased to

* Read before the American Ophthalmological Society, May, 1907.

R. 4/ix; L. 2/lx. There is great dilatation of the left central retinal vein where it disappears in the nerve head. Otherwise the ophthalmoscopic picture is unchanged.

1903, March 6.—Vision still failing. R. 4/xv; L. light perception in the central nasal portions of the field. Pupils: R. 6 mm., L. 5 mm. They do not react to light thrown into the left eye, but react fully to light thrown into the right eye. There are no signs of any new fundus changes. Field of vision for the right eye is about normal—doubtful concentric contraction.

About this time the patient was studied as to her general condition by Dr. J. N. Hall,¹ who reported her case. He says: "The patient slept and ate well, suffered no pain and was always thirsty." (This was, perhaps, dryness of tongue and mouth rather than true thirst.) "There was no constipation. Her lips were tremulous. Her dyspnea was very marked upon the exertion of removing her clothing for examination of the chest.

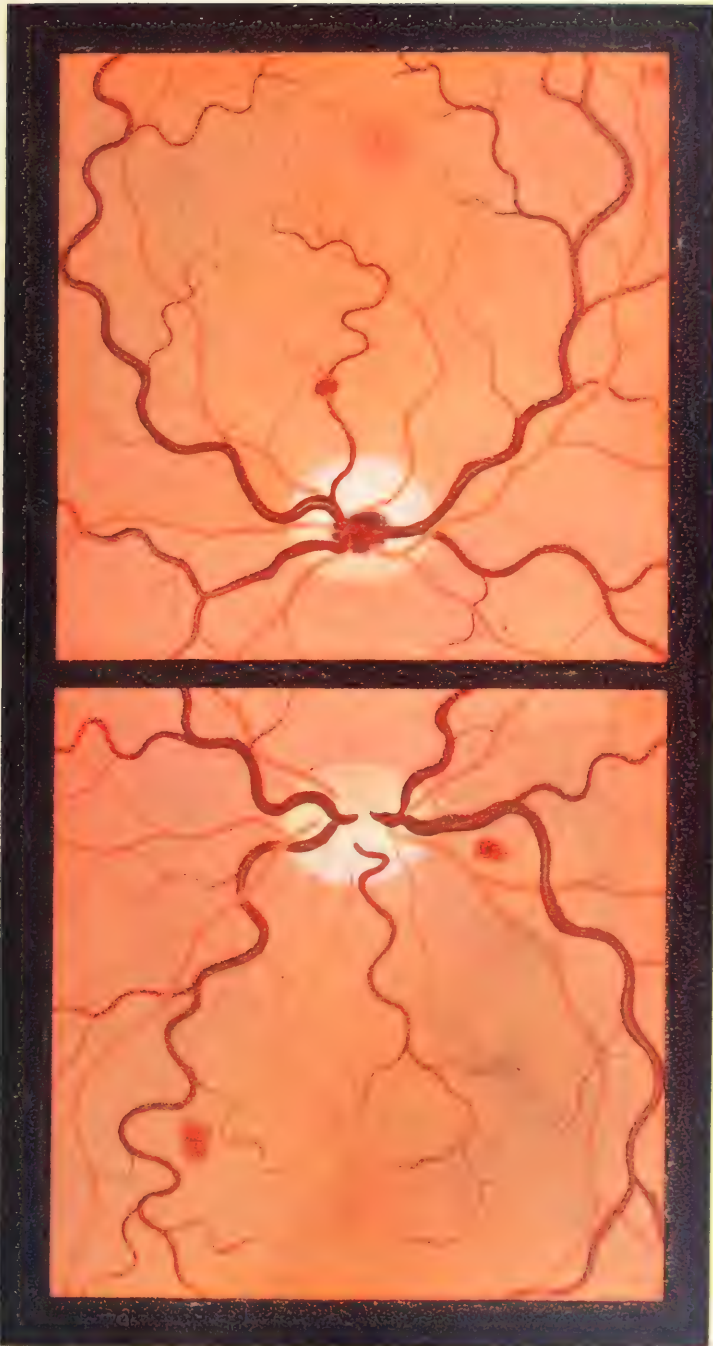
"The most striking feature in her appearance is a cyanosis of such intensity as to be startling, giving her lips and tongue the shade of a ripe Concord grape. It is slightly less marked upon the hands, and still less upon the trunk and lower extremities. Over the face are to be seen tortuous veins which are almost black in appearance and 2 to 4 mm. in width. Although I noticed no especial change in her color at my examinations, her daughter stated that she showed a dusky flush at certain times, especially after excitement, which was very noticeable. The fingers are not clubbed. Her height is but little over five feet; her weight, 160 pounds.

"The respirations were 30 while seated, the pulse beats 84 per minute, the temperature normal. Pulse strong, regular and of increased tension as compared with the normal; arteries moderately atheromatous. The heart was, if anything, slightly larger than the average upon percussion, the sounds all sharp and clear, the aortic second sound moderately accentuated. The examination was less satisfactory than usual because of her obesity, but of the points enumerated there could be no doubt. The lungs were negative except for a few crackles in the bases, probably in the light of the edema of the legs and the condition of the urine, edematous in character. There was no evidence of emphysema.

"The thick abdominal walls made the examination of the spleen very difficult. Enlargement was especially sought for, but I could not find it. The organ was certainly not greatly enlarged. The abdominal examination was otherwise negative. No enlarged glands were detected. There was moderate edema of the feet and legs, and had been for years. None elsewhere except as noted in the lungs. Knee-jerks were normal.

"The urine amounted to nearly 2,000 c.c. in the 24 hours. Specific gravity 1012, albumin estimated by Dr. McGraw at 0.5 per

1. *American Med.*, June 29, 1903.



cent. by weight. A moderate number of optoidal casts were found in the centrifugal sediment, but curiously scarcely any hyalin or granular ones."

The blood was reported upon as follows: "The drop obtained by puncture was extremely dark in color and coagulated so quickly that it could scarcely be removed from the capillary tube for the blood count. Reds, 9,949,600; normal in character. Whites, 6,500; normal in variety and proportion. The hemoglobin was estimated at 170 on the first examination, January 8 (von Fleischl), and 200 on March 6. It was found necessary to dilute the blood twice as much as usual before making the estimation."

1903, April 23.—Corrected vision in R. E. 4/ix. The vision varies somewhat from day to day.

1903, June 19.—Corrected vision R. 4/vi partly; L. counts fingers at one foot. Faint haze of lens and vitreous in both eyes, but not more than usual in persons of her age. The discs are slightly red and hazy. The accompanying water-color sketch made at this time shows the fundus changes in both eyes. It is to be noted that the retinal hemorrhages found are not flame-shaped, but rounded, with faintly shaded borders. No white spots are detected in the retina. The sinus noticed in the left nerve is present and probably twice as large as when first noted over a year ago. It is distinctly bluish toward its periphery and differs in appearance from anything I have seen before. The distension of the retinal veins is not uniform. They look about as when first seen nearly two years ago. The sketch does not exaggerate their size or dark purple color (see colored plate).

1903, Sept. 21.—Vision R. 4/ix mostly, L. fingers at one foot in the lower nasal quadrant of the field. The patient was not examined after this date. She spent some months at a lower altitude, in California, with very little change in her condition. Subsequently she returned to Denver and continued without marked alteration in vision and in about the same state of health until June, 1904, when she died after a few hours' illness with symptoms of acute cardiac failure. No postmortem examination. The patient's son thinks that her mother (his grandmother) presented a similar discoloration of the lips and face, and enlarged veins, during the later years of her life. The patient's children are still under middle age. None have shown any symptoms of this condition.

Including the one here reported, over 50 cases of apparently this disease are now on record. See Osler,² Englebach and Brown,³ Koster,⁴ Watson,⁵ Uhthoff,⁶ and J. M. Anders.⁷

2. *Amer. Jour. Med. Sci.*, August, 1903.

3. *Jour. Amer. Med. Assn.*, Oct. 20, 1903.

4. *Wiener med. Wochenschr.*, 1904, Nos. 6 and 7.

5. *Liverpool Med. Chir. Jour.*, July 19, 1893.

6. *Klin. Monatsbl. f. Augenheilkunde*, December, 1903.

7. *American Journal of the Medical Sciences*, June, 1907.

In most of these cases, enlargement of the conjunctival veins along with those of the face and other parts of the body has been noted. In every case in which a careful ophthalmoscopic examination is reported, so far as I have access to the literature, the dark color and dilatation of the retinal veins have been observed. In Uhthoff's case, presented at the Heidelberg Congress last year, the dilatation of the veins was noted as quite irregular. The arteries are described as probably somewhat broader than normal and a little darker colored, but not strikingly altered. In the case of Englebach and Brown, it is stated that the veins were large and dark blue. In Cabot's second case, "retinal examination showed dark and dilated veins, while the arteries looked normal or a trifle contracted." In Koster's case, examination by Bielschowsky showed the same disturbances in the retinal circulation, to which were ascribed attacks of monocular blurring of vision. In Loman's case, reported by Osler, it is stated "conditions of the fundi were negative with exception of tortuosity of the vessels." In Stockton's case, reported by Osler, "both discs hyperemic, retina surrounding discs thickened; vessels, particularly veins, engorged and tortuous."

In my own case the visible changes in the circulation were confined to the veins. It seems at least uncertain whether any marked alteration has occurred in the arteries in any case yet reported, although loosely worded references might be interpreted as implying arterial changes. The essential pathology of the disease is still in doubt. The natural supposition would be that the primary departure from normal was in the blood-making organs. Great changes in the spleen have been noted in some cases, but were absent in others. The same is true regarding the bone marrow. Hall says: "It seems possible that the increase in the reds may be a compensatory process—an attempt to make up the deficiency in oxygen-carrying capacity in individual cells by an increase in the number of cells."

As an hypothesis worthy of further investigation I would suggest that such conditions might arise from a primary lesion of the general venous system, leading to venous dilatation and stasis, with consequent impairment of the capillary circulation, and with secondary compensatory increase in the number of blood cells and the percentage of hemoglobin. The capillary circulation is profoundly influenced by the venous blood pressure. If the blood-making organs respond to demands on the part of the body for an increased supply of oxygen-bearing blood discs, it is altogether probable that response is to demands that come from the domain of the capillary circulation. The disturbance of the arterial circulation in this

disease is certainly insignificant as compared with the venous. The blood pressure in the arteries in the cases thus far reported shows no striking characteristic change. The venous pressure, so far as I know, has not been carefully studied.

The probability of retinal hemorrhage would occur to any one seeing the dilated and tortuous veins that have always been noted, and yet, so far as I know, it has not been reported in other cases. It was only noted at one time in this case, and then it escaped detection until the pupil was dilated with cocain for the purpose of sketching the fundus. Cabot's first case died of a small cerebral hemorrhage. While the apparent venous congestion would be taken to favor hemorrhage, the extreme viscosity of the blood which has been noted in these cases would oppose it. The careful search for retinal hemorrhage is worth making, and it will be interesting to note if the rounded form instead of the flame shape holds generally for such hemorrhages. This rounded form may depend on the layer into which the hemorrhage occurs or possibly on the tendency of the blood to very rapid coagulation.

With regard to impairment of vision, the general blurrings of sight in my case might be due to circulatory disturbance in the retina. Temporary impairment of vision has been noted in several cases, and Koster's patient was also subject to attacks of ophthalmic migraine, ascribed to disturbances of the cerebral circulation. The loss of vision in my patient's left eye seems best explained by pressure within the nerve trunk from the enormously dilated central retinal vein.

Uhthoff suggests that slighter degrees of chronic cyanotic polycythemia may not be very rare, and the ophthalmoscope may help to call attention to such cases. It may at least be said that no case of this disease has been carefully studied until a careful ophthalmoscopic examination has been made. And it is not unlikely that careful ophthalmoscopic studies of such cases will throw important light upon the pathology of cyanotic polycythemia.

THE KILLIAN FRONTAL SINUS OPERATION: ITS RELATION TO OPHTHALMOLOGY.

REMARKS ON THE USE OF THE X-RAY IN SINUS DISEASE.

HENRY GLOVER LANGWORTHY, M.D.

DUBUQUE, IOWA.

[Illustrated.]

That any surgical procedure about the eye as extensive as the radical Killian frontal sinus operation should be understood by the ophthalmologist is self-evident. The method of Killian may be said to hold the same relation to the inner orbital wall as does Krönlein's temporary resection to the outer, with the exception that the former is performed for a totally different pathologic condition. As has been outlined by Mosher¹ in an excellent paper on "Inflammation of the Frontal Sinus," cases of chronic suppuration of the frontal sinus may be divided into two distinct groups:

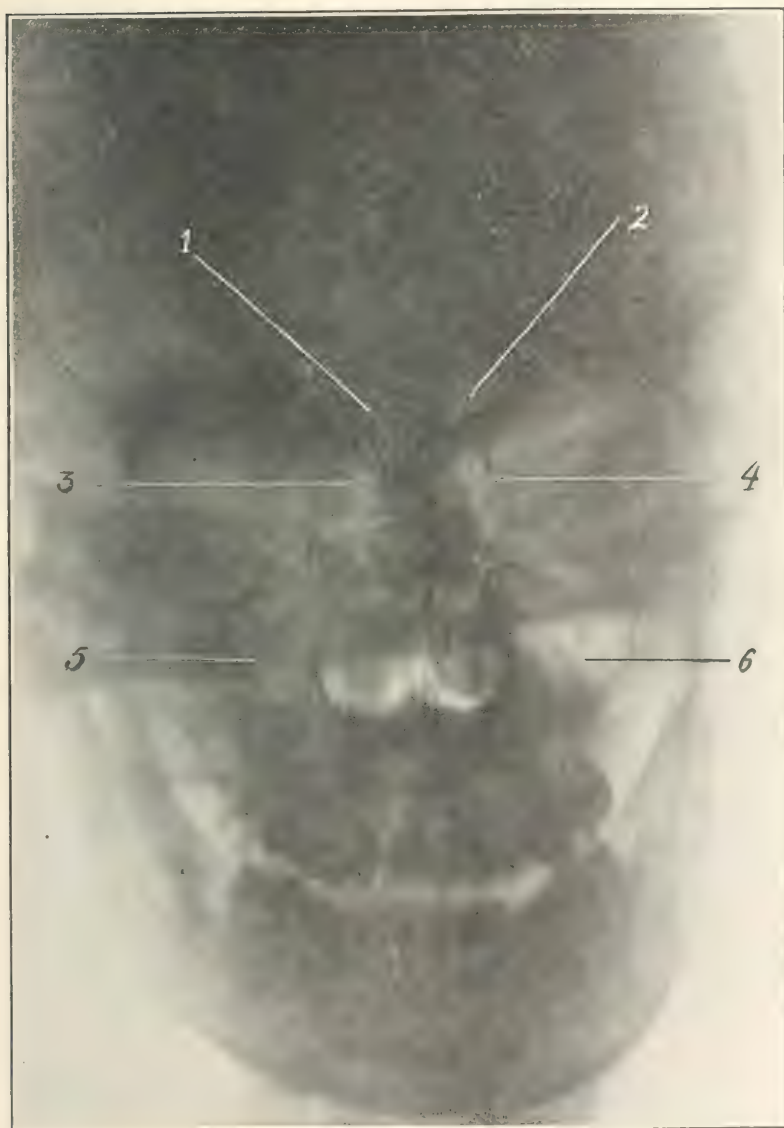
First.—A group where the chief features are the eye symptoms.

Second.—A group where the prominent features are pain and nasal discharge.

The first group of cases come to the eye clinic; the second, as a rule, come first to the nose and throat department.

The characteristics of the group seen in the ophthalmic clinic are: tumor, usually ethmoid, just above the inner canthus; second, exophthalmos, the displacement being down and out, and, third, little, if any, pain. Diplopia is not constant. Occasionally diplopia is the single symptom causing any great amount of inconvenience. In the majority of the cases there is no history of nasal discharge, and an examination of the nose is likewise negative. The exophthalmos is due to the pus breaking through the inner wall of the orbit either directly from the ethmoid cells or from the floor of the frontal. If the tumor is ethmoidal, the rough outline of the point of entrance through the lacrimal bone may sometimes be felt.

The history of the so-called eye case is as follows: The patient, an adult of 50 years of age, let us say, some eight or nine weeks before coming under observation, noticed a lump in the inner angle of the orbit, just above the inner canthus. There may have been dull pain on pressure over the frontal sinus of the affected side from time to time and unilateral headache. Gradually the eyeball



Antero posterior plate.

Fig. 1.—Photographic prints of x ray plates fail to show detail like an original negative. This is especially true of skull pictures. The frontal sinuses indicated by lines 1 and 2 are not shown at all, and the ethmoid regions, 3 and 4, could not be seen. The right antrum, 5, more opaque than the left antrum, 6, was not dark in the plate itself. The fine bone tracings and normal outline of the sinuses which should appear can not be distinguished.

was pushed outward with but little limitation of movement. The orbital swelling, about the size of a small marble, is found firm, elastic and fluctuating. There may be slight drooping of the upper lid. The frontal sinus is not tender, and it may be difficult to say whether the orbital process has a direct connection with the frontal sinus or ethmoid cells. The tumor is often painless and the skin not reddened. Nasal examination is more often negative, as has been said. At operation the whole ethmoid labyrinth (anterior



Right lateral plate.

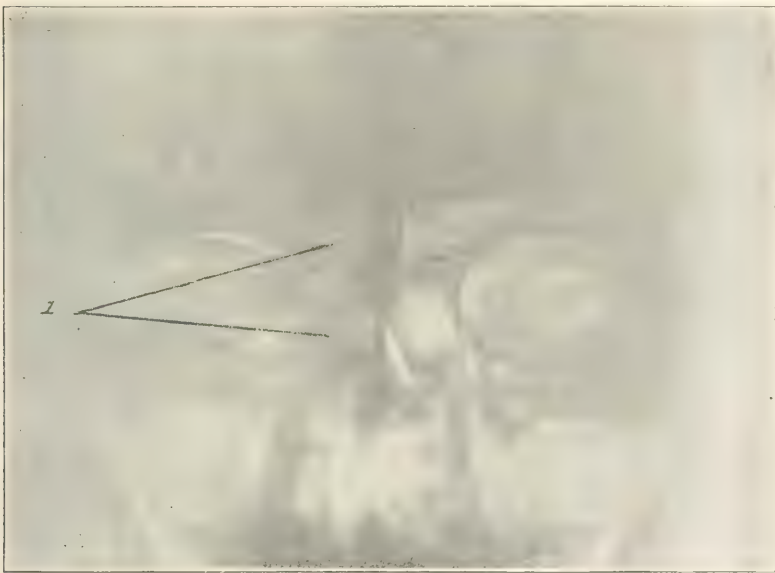
Fig. 2.—Taken originally as a right lateral plate to be compared with the anteroposterior view, Figure 1, in the same individual. The resulting reproduction is so dark, however, that this is impossible. A small frontal sinus well down in the brow can faintly be made out.

and posterior cells) is discovered filled with muco-pus and the floor of the frontal sinus wanting either in whole or in part. That such an extensive destruction of bony walls could exist without intranasal signs or acute pain is hard to believe. In reality, the Killian procedure to be described later is but following along the

lines laid down by Nature herself, who has already performed the greater part of the operation.

In the class of cases where the symptoms are chiefly pain and nasal discharge, the only eye symptom of any importance, as would be expected, is edema of the upper eyelid, chiefly the inner half. There is no orbital tumor or exophthalmos. The nose shows the pus coming from under the middle turbinal or polypi. Tenderness over the sinus is subject to acute exacerbations.

To clinch the diagnosis of pus in the ethmoids or frontal sinus, we resort to the use of the *x*-ray, taking a picture of the face (antero-posterior view). Lateral views are not of as great value



Antero-posterior skiagraph.

Fig. 3. Right frontal sinus and ethmoid region opaque, due to pus. The print is a poor one and does not show any of the finer details of the normal left frontal sinus, such as possibly septa or the presence of an orbital procunation.

as the antero-posterior plate, although they do give the height and size of the sinus and its encroachment on the brow.

So much information is given by *x*-ray plates that hardly any sinus operation should be performed without them. It is true that the subject is a comparatively new one and as yet incompletely worked out, but from our present knowledge it would seem that the value of the plates has certainly not been overestimated. Already the use of the *x*-ray has become almost a routine practice for giving the size and location of the frontal sinus. In the past eighteen months I have studied a considerable number of plates.

from which a diagnosis of pus within both a frontal sinus and ethmoid cells on the same side could be made, and operation steadily bore this out.⁵ The stumbling block at first encountered is that the *x*-ray plate, in order to be of the greatest value, must be interpreted by an expert. The beginner may not be able to make a diagnosis of pus, but he can, from a lateral plate, at least find out whether there is a sinus on the side upon which he desires to operate, its location, orbital prolongation, possibly the presence of septa, and, in a general way, the relationship between the floor of the frontal sinus and the anterior ethmoid cells. In regard to the detection of pus in the antero-posterior plate, it is necessary to state

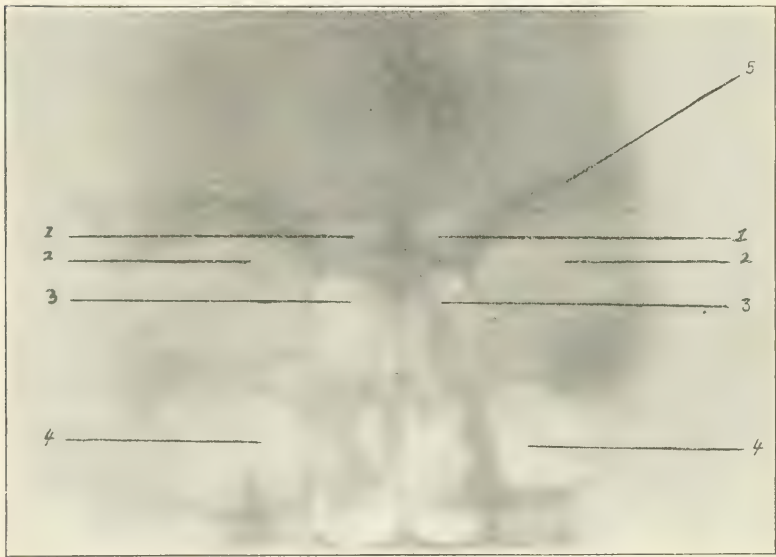


Fig. 1. Young girl, W. S., age 12 years. Anteroposterior view showing normal sinuses. Patient had orbital abscess, O.S., caused by falling from a chair. Discharged well in two weeks. X-ray of accessory sinuses negative. Frontal sinuses small, above root of nose. 1. Frontal sinus. 2. Orbital regions. 3. Ethmoid region. 4. Antrum of Highmore. 5. Dark line given by wings of sphenoid bone.

that the difference between a diseased and a normal sinus is so slight that a positive diagnosis must be made very carefully.

Occasionally one is asked why it is so important to know the size of the frontal sinus before operation. The chief reason is not only to be able to select the operation giving the least possible deformity, but also to know how high the first opening into the sinus should be made. Transillumination can not be relied upon to give the size of the sinus; the *x*-ray plate, however, solves that difficulty. It is rather rare in surgery, as has been pointed out

by Killian and Hajek in Europe, and Coakley and Mosher in this country, for surgeons to have such knowledge before hand.

The picture of pus within a sinus is as follows: In cases of unilateral disease of the frontal or ethmoid cells, a cloudiness is observed in the plate over the area occupied by the sinus. This indistinctness is best made out when compared with the opposite or healthy side. In a normal sinus, one gets a clear general outline of the sinus wall and a relatively clearer space within. In a diseased sinus filled with pus, the side affected is more opaque than the free side and sometimes practically obliterated. The result of this process of "matching up," so to speak, is then applied to the case at hand.⁵ As the cloudy appearance is not unlike that of "fogging" in a plate, as described by Coakley,² one must be sure that

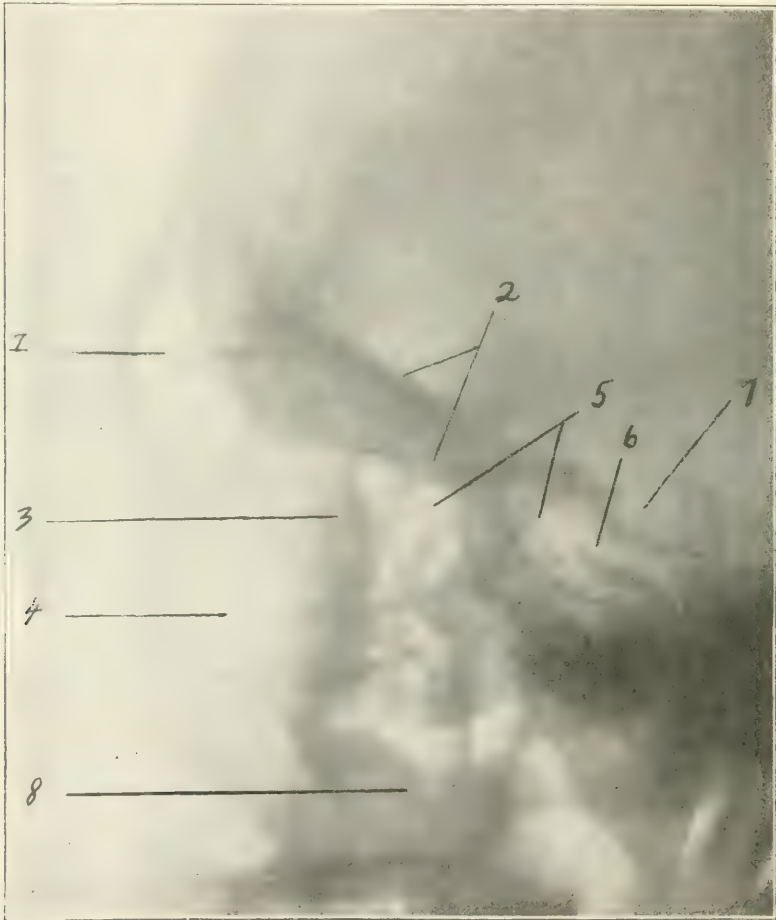


Skiagraph of an adult head (cantero posterior view) showing left suppurative ethmoiditis.

Fig. 5. 1. Normal right ethmoid cell area. 2. Left ethmoid suppurative ethmoiditis. 3. Region of right frontal sinus. Plate is a poor one, and does not show the frontal sinus at all distinctly. This is not infrequently the case. 4. Region of left frontal sinus. Positive diagnosis can not be made. As sometimes the left frontal floor was wanting, having shared in the same process as the ethmoid cells.

the best picture possible has been obtained. Poor plates should instantly be rejected. The same applies to the ethmoid region, besides giving the height and width of the area. The cloudiness in cases of suppurative ethmoiditis, or in connection with polypi, is even more marked than in the frontal sinus. In the type of cases seen by the ophthalmologist, in which the ethmoidal contents has already perforated the orbit, causing an orbital tumor, divergence and exophthalmos, the x-ray plate is rarely of standing.

It would be a mistake to claim that such a method is infallible. It is possible to get an occasional condition of sinusitis in the particular class of cases discussed in this paper, in which the pus seems to have been gradually replaced, perhaps by blood products, as transparent as the normal mucous membrane.⁵ One would also hardly expect an *x*-ray plate to show a little pus filling one-fifth



Skiagraph, left lateral view.

Fig. 6.—Young engineer, age 22 years. Taken to determine question of a foreign body (glass) within the left eye ball. Patient received a penetrating wound (O.S.) through ciliary region. No foreign body discovered by *x*-ray. (Glass does not always throw a shadow.) An unusually good picture of the sinuses. Outline of sphenoidal sinus well shown, clinoid processes and sella turcica prominent. 1. Frontal sinus. 2. Lines given by the floor of the anterior cranial fossa. 3. Malar bone hiding a portion of the anterior ethmoid cells. 4. Orbital region near opening of lacrimal duct. 5. Region of posterior ethmoid cells. 6. Sphenoidal sinus. 7. Sella turcica. 8. Region of left antrum.

of the sinus. Fortunately, however, the infiltrated mucous membrane often gives the shadow.

Coakley: First. It is possible by means of a skiagraph, to ascertain the presence or absence of a frontal sinus which extends vertically above the glabella.

Second: A frontal sinus may be small, parallel with upper, inner margin of the orbit and not detected in the skiagraph.

Third. In all cases of unilateral disease of the frontal sinus, verified by operation, a cloudiness has been observed in part, or all of the area occupied by the sinus and an indistinctness in the outline of the cavity, when compared with the opposite or healthy side.

Fourth: The examination of a skiagraph of the two frontal sinuses when compared with the results found on transillumination, will aid very much in determining the presence of a diseased frontal sinus.

Fifth. A skiagraph may be of considerable value in determining the height and width of the ethmoidal cell area.



Fig. 7. The long curved skin incision nicked at intervals for a better union.

To recapitulate a little: It is best, then, to take a series of three plates, two lateral, one for each side and an antero-posterior. The antero-posterior is for the purpose of demonstrating pus and "matching up" in the same plate, one sinus area with its fellow on the opposite side. As this is the hardest plate to secure, it may be necessary to repeat. The lateral plates give the size of the frontal sinus and its encroachment on the brow. It is not safe to try and compare them, as the respective sides of the head are seldom alike.

Mosher: It should be remembered that in acute inflammation of the frontal sinus, the infiltrated mucous membrane will give a shadow on the plate. If one wishes, the progress of the inflammation can be watched by making successive

plates. Without a history which indicates it, the presence of a shadow in a suspected sinus does not always mean chronic inflammation of the sinus. Even when chronic inflammation of the sinus does exist, if the pus has been discharged into the nose, or into the orbit, there may be no shadow on the plate. On washing out the antrum in one case, and then using suction by means of the vacuum apparatus, a plate taken after this had been done, made the diseased antrum look like a normal antrum, even more normal than the undiseased one.

The *x*-ray has helped least in connection with the maxillary antrum. However, it gives the size of the antrum and will show projection of tooth roots. Hardly one-half of the cases indicate pus.

The importance of plates in sphenoidal trouble has still to be developed. If the *x*-ray tube is focused on the sphenoid from the side, a very fine outline of that structure can be obtained. Just how this is going to help us is something of a puzzle. Even if one sphenoidal cavity should be filled with pus, in an antero-posterior plate, the shadow would occupy part of the ethmoid region or be obscured by the turbinate. On the other hand, it is not uncommon, in lateral plates, to have all sorts of obscuration of the sphenoid.

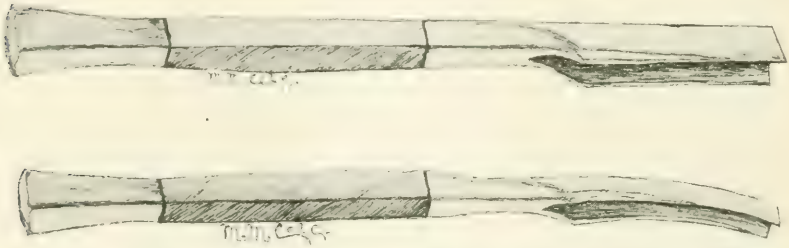


Fig. 8. Killian's straight and curved v shaped chisels which are used to first groove the bone and penetrate the sinus. They are especially useful in outlining the area of orbital wall to be resected and in furthering its removal without splintering adjacent bone. (Reduced about 1/3.)

noidal and posterior cell area in normal plates. This lack of sufficient contrasting background, or even neutral areas, is keenly felt. It is too early, however, to give up hope, even under such unfavorable conditions. I have attempted to tabulate the lateral sphenoidal plate with reference to double optic neuritis of obscure, possibly sphenoidal origin, in fracture of the base of the skull, causing aneurism of the internal carotid artery within the cavernous sinus and in other somewhat allied conditions, with the expectation of finding a clue to solve this sphenoidal plate, but so far without success. That it will give much confidence in an operative treatment of a thrombosed, cavernous sinus, in contact with the sphenoid, seems probable. In the *Laryngoscope*, July, 1906, page 521, the author, after considerable experimental work on the cadaver and an observation of six cases, published a distinct operative procedure which was adapted to thrombosis of the cavernous sinuses of

both otitic and ophthalmic origin. The suggestion of *x-ray* plates as a help in these conditions to secure the outline of the sella turcica and size of the sphenoidal cavity before operation is a new one and should be utilized in every case (see also *Laryngoscope*, October, 1906, and *Boston Medical and Surgical Journal*, April, 1907).

The advent of the *x-ray* in all orbital affections of obscure origin will, I believe, prove a distinct step forward. It has helped me most in dealing with orbital abscesses, when often without it I would have been lost. If the *x-ray* is not decisive, an exploratory operation is usually required.

Our present knowledge of the etiology and pathology of chronic frontal sinus suppuration is meager. The pathologic picture, in so far as can be described, is somewhat as follows: During an acute inflammation the mucous membrane lining the sinus becomes inflamed and discharges a considerable quantity of fluid (mostly serum). The cavity being insufficiently drained, the edema of the mucous membrane persists, blocking the osteum. As the pyogenic

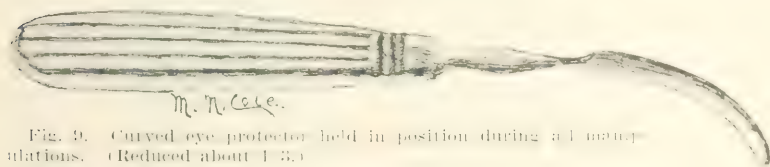


Fig. 9. Curved eye protector held in position during a lumen operation. (Reduced about 1/3.)

bacteria invade the sinus, or already present in the mucosa, the serum is converted into pus. Gradually the mucous membrane becomes thicker in areas and undergoes polypoid degeneration. The process goes on and on until the bony wall begins to show signs of a rarefying osteitis. Finally, the pus becomes old, mixed with mucus and almost sterile. With absorption of the bony wall, these retained secretions (pus and mucus) escape into the orbit. The end product, if allowed to go on, and did not perforate externally of its own accord, would probably be the ordinary mucocele of the older writers.

Apparently the patient suffers so little inconvenience that it is often many months before objective symptoms force him to seek medical advice.

The operation indicated in these cases with orbital tumor and exophthalmos is the Killian operation, which is comparatively free from danger, produces the least possible disfigurement and requires but a short after-treatment. In most cases the patient is discharged from the hospital, well, in nine or eleven days. The procedure re-

quires a thorough anatomic knowledge of the region and considerable surgical ability.

Operation.—The eyebrow is not shaved. The incision begins at the temporal end of the brow, extends inward as far as the root of the nasal bone, curving downward along the side of the nose. In other words, the incision is the usual frontal one, elongated and carried down the side of the nasal bone (figure showing skin incision). The cut is nicked for a better coaptation. The frontal sinus is then opened with one of the Killian V-shaped chisels, made for the purpose. The first hole in the sinus is made to find out its size, after which the anterior wall is removed along its entire extent (but not too low) and the edges are beveled. Leaving the frontal



Fig. 10. Extent of bone removal in a Killian operation. The entire floor and most of the anterior wall of the frontal sinus has been resected together with the inner orbital wall. Note the bridge of bone with its periosteum attached left along the brow to prevent deformity.

sinus for a moment, a second hole is cut through the inner orbital wall into the nose. Thus, between those two openings, a bridge of bone is left along the brow with its periosteum still attached (figure showing bridge of bone and extent of bone removed). This bridge is very important and must not be broken. To save the periosteum, two incisions are made early along its edge. The bridge of bone is to prevent deformity. A considerable portion of the inner wall of the orbit is then boldly resected, and through this opening, from in front the ethmoidal cells are curetted and the whole of the middle turbinal removed, if necessary. Through the

orbital opening also any part of the floor of the frontal sinus can be reached and curetted away more easily than through the frontal opening from above.

The Killian V-shaped chisel is not as good an instrument to break through the inner orbital wall as the Krause burr. There is little danger of a burr splintering the bone. The eyeball, during the manipulation, is protected with the Killian eye retractor. The opening of the frontal sinus down into the nose is made as large as the sinus wall will allow, which means the entire floor. A long strip of selvaige gauze is packed in the ethmoid region, with the end hanging out of the nose. It is best to allow one end of the gauze strip to project into the frontal sinus and drain the subsequent blood products. Bloodclot in this region seems prone to cause a periostitis. Finally, the wound is cleaned and sutured. After forty-eight hours, the nose is dressed every day. The sutures are removed on the fourth or fifth day.

Killian himself is in the habit of filling the nasal cavity of the affected side with four tampons of cotton, rolled in the form of a cigarette and tied about the middle with a slender thread. The fourth, the most important, he places firmly in the anterior part of the nose, high up beneath the nasal bones and between the septum and the ascending nasal process of the maxilla. The idea of the last tampon is to support the mucous membrane covering the nasal chamber, besides helping to prevent injury to it. At the close of the operation, a flap is made of the uninjured mucous membrane and sutured to adjacent healthy mucous membrane. This flap is not wholly necessary, as the cases have shown. By packing the choana with cotton tampons, Killian practically does away with a postnasal plug. Often, however, it is most advantageous to use the postnasal plug as well. The tampons are a great help, in that little space is left for blood to collect within a large nasal chamber. Without packing, the blood collects so rapidly that it is impossible to see the operative field.

As much of the internal wall of the orbit may be removed as one thinks necessary to complete the operation. Ordinarily, the limits of bone removal will be the trochlear attachment and supraorbital margin above, the anterior ethmoidal vessels behind and the lacrima groove below.

The following answers to questions which have been raised by eye specialists as to the after-results of such an extensive procedure show how fully the conditions of an ideal operation are satisfied:

First.—There is no recession of the globe. The bony defect is not only taken up by the orbital contents, but a scar is soon formed that

by a tough layer of connective tissue, which well serves its purpose.

Second.—Even if the pulley of the superior oblique muscle is severed or torn away, it soon reattaches itself. There is no diplopia.

Third.—Prying the lacrimal sac out of its fossa is also productive of little harm, and there is no later disturbance in function.

Fourth.—Traumatic inflammation of such a structure of the globe, as, for instance, the iris, is seldom encountered.

Fifth.—Vision is not affected, except that it is sometimes improved.

The end results on the mucous membrane of the upper respiratory passages seem, perhaps, not yet fully settled in the minds of some rhinologists. In this country, the operation has been performed perhaps five years. For that length of time only can I speak. So far, I am glad to say, the result has more than justified the means. The men who have visited Killian's clinic at Freiburg, in Breisgau, and have seen some of his cases, ten or twelve years after the operation, are not so sanguine, claiming that atrophic rhinitis, chronic laryngitis, etc., follow such destruction of turbinal tissue.

In conclusion, it may be stated that, as it is fast becoming the universal practice of ophthalmologists to either examine or have the nasal cavities explored in every instance of orbital tumor or exophthalmos, it is unnecessary to more than emphasize the importance of knowing the operation indicated in a decidedly special line of cases. A careful study of *x-ray* plates and the lines given by the different bones of the face and skull is sure to yield a profitable return.

Langworthy (H. G.): External Eye Inflammations of Doubtful Origin, *Boston Med. and Surg. Journal*, October, 1906. Two cases were reported in this paper which illustrate the use of the *x-ray* in questionable sinus disease. Case 1.—Bilateral orbital cellulitis and exophthalmos of obscure origin simulating cavernous sinus thrombosis and double frontal involvement in a young adult male. In spite of the extreme local conditions and temperature the patient's mind remained clear. Recovery with subsidence of symptoms occurred in about seven days. Various etiological factors, including drugs, beginning erysipelas, bites, post-influenzic and caries of the body of the sphenoid were considered. Cultures from the conjunctival discharge showed chiefly pneumococci. *X-ray* plates showed no involvement of frontals, ethmoid or antrum on either side. The sphenoid bone with its cavity was beautifully outlined in the lateral view, but failed to throw any additional light on the case. The plates were very comforting in helping to rule out the possibility of sinus trouble. Case 2.—Acute bilateral edema of the eyelids of unknown etiology. Edema chiefly outer half. Question at first of double frontals or angioneurotic edema. *X-ray* plates showed location and size of frontal sinus and no pus. Negative plates were expected. Later two circumscribed areas of similar nature appeared on the body and forearm indicating the trouble to be a type of trophoneurosis. The lateral view of the sphenoid and posterior ethmoid cell region was very clear. Radiograms had better be stereoscopic.

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PULSATING EXOPHTHALMOS TREATED BY EXCISION OF A DILATED ORBITAL VEIN.

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OMAHA, NEB.

[Illustrated.]

Cases of pulsating exophthalmos generally pass into the hands of the surgeon by way of the oculist. The eye symptoms are generally those which first excite alarm, but until recently the general opinion has been that, except in specific cases, the only effective treatment was the ligation of one or more carotid arteries; so that, except for those very rare cases in which a spontaneous recovery occurs (Starkey, Oliver) practically the only cures have been accomplished by the general surgeon. Of late, however, there has been a tendency to throw some of these cases back into the hands of the oculist, as it has been found that ligating one or more vessels of the orbit is sometimes the most effectual treatment.

The treatment of these cases by ligation of the carotids has always been open to serious objections. In the first place it is very frequently ineffectual. The communication between the different arteries at the base of the brain is so free that it is only by cutting off the carotids of both sides, together with the vertebral arteries, that we could be sure of effecting a cure. Now the ligation of even one internal carotid is by no means free from danger, and the danger increases in proportion to the number of arteries that are tied off. Besides the not infrequent cases of cerebral softening and death which have followed this operation, several cases of blindness from thrombosis of the retinal vessels have occurred. Some years ago, in reporting a case of this kind, in which blindness had occurred from ligation of one internal carotid, I urged the advisability of continuing systematic compression of the internal carotid for some time previous to the operation, in order to enlarge the collateral circulation, and thus diminish as far as possible the danger of injuring the eye or the brain. We must, therefore, welcome any method which, while diminishing these dangers, apparently has a greater probability of effecting a cure.

So far as I can learn the proposal to substitute ligation of the superior ophthalmic vein for ligation of the carotids was first made in 1897 by Szimanowsky.¹ He does not appear to have done the

¹ Cited by Sattler.

operation himself, but he strongly urged trying it in cases in which the ligation of one carotid had failed before resorting to ligating the carotid of the other side.

In the next year Lasarew² performed the operation on a 17-year-old girl with pulsating exophthalmos of the right side, of apparently spontaneous origin. The common carotid had been tied without effect, but the deep ligation of the superior ophthalmic vein cured the trouble. This operation was followed during the succeeding three weeks by decidedly alarming brain symptoms, due in all probability to the extension of the venous thrombosis into the cranial cavity; but these symptoms gradually disappeared, leaving a remarkably good result.

In 1905 Schwalbach³ reported a case of a 12-year-old boy who had a knitting needle run into the orbit at the left side. Six months after the accident a pulsating exophthalmos was noticed, and the ligature of the common carotid caused the bruit in the head to disappear for a few minutes, but it returned again almost immediately, and, as Schwalbach feared to ligate the other carotid, an incision was made below the brow and a much dilated vein was found deep in the orbital fat; 3 to 4 cm. of this was excised, the bruit disappeared instantly and did not return, the exophthalmos also was permanently cured.

Sattler⁴ seems to have been the first to perform the ligation of the vein as a primary operation as a substitute for ligation of the carotid. He reports a case of a 17-year-old girl who received a blow on the left temple with resulting pulsating exophthalmos of the same side. A soft, pulsating tumor could be felt just below the eyebrow somewhat to the inner side, while another similar tumor without pulsation could be felt somewhat farther down and to the inner side. Both these tumors collapsed when the carotid of the same side was compressed. The operation showed these tumors to be dilatations of the superior ophthalmic and angular veins, respectively. The former of these was followed back, tied off as far back as possible and excised, whereupon the other tumor disappeared at once, with cessation of the bruit, which had previously been audible over the tumors. No attempt was made to find the second tumor; the wound healed without reaction; and, although for several days after the operation there was severe pain in the occiput and a remarkable slowing of the pulse, these symptoms disappeared and a complete cure followed.

2. Cited by Sattler.

3. *Deutsche med. Wochenschr.*, 1905, 29; also *Klin. Monatsbl. f. Augenheilk.*, July, 1905.

4. *Klin. Monatsbl. f. Augenheilk.*, July, 1905.

Finally, F. Park Lewis⁵ has just reported a brilliant result in a case of pulsating exophthalmos following a blow on the head, in which what is described as an aneurism of the ophthalmic artery was dissected out of the orbit with no injury to the eye and with a cure of the most distressing symptoms.

The case which I have to report is unique in some particulars, but it indicates the value of getting at the dilated vessels in the orbit if this can be done without too much danger to the eyeball.



A. Benson, 4 yrs. after injury, 3 yrs. after ligation of common carotid (spontaneous thrombosis of orbital and cranial sinuses?).

Axel Benson, aged 24, on Dec. 2, 1901, was struck on the head with a shovel and knocked unconscious. Some six months later noticed undue prominence of left eye, and two months later, on taking up heavy work, noticed throbbing noise in his head. He consulted me on Aug. 2, 1902. I found the left eye to be quite prominent with normal fundus, V. 20/L, enlarged veins in the

⁵ Ophthalmic Record, February, 1907.

upper lid, bruit heard over eye and left side of head, slight pulsation left eye. As I felt that the treatment must be primarily surgical, and as the man had entered the Methodist Hospital, he was turned over to Dr. Jonas, who tied his external carotid, but this produced comparatively little effect. Within a month the common carotid was tied and a much dilated vein of the upper lid was also tied. Immediately after this operation the exophthalmos became much more marked with a great deal of pain. The protrusion was so great that the cornea began to ulcerate from exposure, and the lids had to be united to protect the cornea. These symptoms then subsided and, although considerable exophthalmos and some noise in the head remained, he felt comparatively well except for an occasional spell of swelling of the orbital tissues, which he reduced by hot water, up to Oct. 7, 1905. At that time it got much worse. The trouble starting with a sort of toothache, not relieved by tooth pulling, with much nausea and pain all through the head. The pain and swelling increased so much that he consulted me again on November 11. I found the left eye to be much protruded with an immense roll of edematous conjunctivitis protruding between the lids. Complete ptosis, very slight movement of the eye in any direction. Pupil moderately dilated. Nerve atrophic-looking. V. = fingers at 1 to 2 feet. Above the eye a tumor about $1\frac{1}{4}$ inches in diameter could be felt beneath the eyebrow. This pulsated a little and obscure bruit could be heard over it. He says that he noticed the beginning of this tumor not long after his common carotid was tied, over two years before. He thinks that for the last month or so it has not been quite so large as before, and the pulsation is not so marked. He was sent to the Methodist Hospital, and iodid of potash and hot applications given, but the swelling kept increasing and the pain became so intolerable that he insisted on having something done. In fact, he said that he wanted to die if he could not be relieved of the pain soon. As only a very slight pulsation could be felt in the neck above the scar, it did not seem likely that any further surgery on his neck would be effective, so I decided to remove the tumor above the eye, thinking it was a dilated vein. On November 8 I made an incision just above the brow and by a very careful dissection removed the tumor, which was followed back to near the apex of the orbit, great care being taken not to open it for fear of serious hemorrhage. This fear proved to be groundless, for, on nearing the apex of the orbit, toward which it tapered rapidly, it broke off as the ligature which I applied was tightened, without any hemorrhage occurring. The tumor turned out to be a much enlarged vessel filled with solid

blood, having the shape of a large, flat horse chestnut, about $1\frac{1}{2}$ inches across by $\frac{1}{2}$ inch thick. The pedicle was about $\frac{3}{16}$ of an inch thick where it broke off in the depths of the orbit. No reaction followed this operation and the symptoms improved rapidly. The pain ceased and the exophthalmos and conjunctival swelling disappeared. The vision and motility of the eye improved, but the ptosis remained complete. He went home within three weeks feeling perfectly well. When he returned in May, 1906, the ptosis was still nearly complete; but there was no sign of exophthalmos nor inflammation; the eye was freely movable except upward, in which direction the motion was limited. The ophthalmoscope shows a pale, although not entirely atrophic disc, with vision 20/xxx; no bruit could be heard by me, but the patient said that he occasionally had some noise in the head, but no pain. I did an operation to relieve the ptosis as far as possible, and he had no further trouble so far as I have heard. I am quite sure that I should have heard if anything had gone wrong, for the patient is of a very anxious disposition and has railroad transportation free.

I think there can be no doubt that the tumor in this case represents a much dilated portion of the superior ophthalmic vein, and the fact that the patient noticed the tumor in the upper lid shortly after a large superficial vein had been tied indicated that this was the starting point of its formation. That after a lapse of nearly three years it should have caused the stormy train of symptoms in which my patient suffered is certainly remarkable. In explanation of these symptoms it seems to me probable that the blood in the tumor underwent a spontaneous thrombosis which extended into the collateral branches in the orbit and to some extent in the brain and thus caused so much disturbance with the circulation as to produce the alarming symptoms indicated. Why the removal of this solid tumor should have caused these symptoms to disappear is not so clear, but the effect of the operation must have been largely mechanical.

I have said that we ought to welcome any effective method of dealing with these cases which is free from the dangers attending ligation of the carotids. From the cases here referred to it is evident that in at least a respectable proportion the ligation of the ophthalmic vein is effective; and I believe that where decided indications of a distended vein can be felt in the orbit this operation will eventually be the operation of choice. Whether further experience with it will show that it is entirely free from danger remains to be shown. The alarming symptoms which followed the operation in the cases of Lasarew, Sattler and in my own case, both after

the first ligation of a superficial vein and later on, coincident with the spontaneous thrombosis of the orbital vessels, indicate that the danger of fatal thrombosis of the brain sinuses can not be absolutely denied. No fatal case has yet occurred, but in recommending the operation the possibility of such an event should not be lost sight of.

KERATITIS DISCIFORMIS.*

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[Illustrated.]

The pathology and symptomatology of this rather unusual form of keratitis has been so recently presented by Dr. de Schweinitz that it would render it trite to again refer to it. The question of diagnosis is, however, worthy of consideration. The designation given the affection by Fuchs is unfortunate in one respect, that it emphasizes its form at the expense of the more essential element of a single focus of infection with an advancing, saturated annular band marking its spread from this point; this resulting in a permanent opacity, which, if its characteristics be borne in mind, should serve to differentiate it from opacities the sequel of other types of keratitis resembling it, however, in form. For the positive diagnosis of this condition the process should have been followed from its incipency through the inflammatory stages to the formation of the cicatrix. That some difficulty should be experienced in diagnosing it from *ulcus serpens* follows from the fact that it differs from it only in the intensity of the process.

I have had in recent years two cases which, in their active stage, bore a superficial and in the resulting opacity a very close resemblance to keratitis disciformis.

The first was one of pustule of the cornea in variola in which the process resembled an abscess, but was not so rapidly destructive as is usually the case, but did finally involve about three-fourths of the central area of the cornea and caused a prolapse of Descemet's membrane. The eye was for many months irritable, but finally became quiescent, so that to-day, about three years since the attack, there is a central, somewhat oval opacity involving the entire thickness of the cornea which has some of the characters of the scar of keratitis disciformis, but with the binocular loup there is seen to extend out in all directions, from the rather dense periphery, much fainter feathery riders, giving to the whole a chrysanthemum-like appearance. It is to be recalled that fine short linear riders are not rare in the condition under consideration and have been attributed by Fuchs to probable rucking of the membrane of Descemet. In my own case, the prolapse of this membrane may have been the

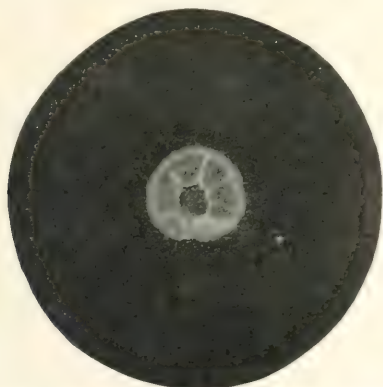
*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

cause of these curious radiations and could be explained after the manner of Fuchs.

The second case was one of herpes of the cornea accompanied by simple herpes of the face as a complication of bronchitis. Here the occurrence of a bleb with subsequent ulceration made the diagnosis clear, but again the oval form and the central site of the resulting scar have produced a resemblance to *keratitis disciformis*.

Both of these conditions have, no doubt, been modified by the use of dionin. In the smallpox case the gradual diminution of the gross scar has been marked, but the underlying capsular deposit has interfered with a corresponding improvement in vision.

The patient exhibited is a man, aged 17 years, who was seen at Wills Hospital for the first time on Feb. 3, 1906. Three days previously he had been struck in the right eye by a hot metallic chip.



Opacity resulting from Disciform Keratitis, oblique illumination and lanthanum lamp.

There was a small spot of infiltration with a shallow hypopion. This was at once touched with the galvanocautery. The affected area obtained a diameter of about 3 mm. before the inflammatory stage subsided.

On March 3 there was noted a central circular nebula at the lower margin of which was a dense white spot. From that time until the present the patient has returned weekly for the instillation of dionin. Under this treatment the disc has become uniformly fainter, but has lost none of its characteristics.

At present there is a disc-like opacity situated in the substantia propria of the cornea which is scarcely visible by the unaided eye in diffuse daylight. By oblique illumination and the binocular loup the opacity is resolved into pinpoint dots with a central area, about $\frac{1}{2}$ mm. in diameter, of brownish color (probably the site of the

cauterization or the lodgment of the foreign body). From this point the dots radiate to the periphery, which is composed of a dense white rim, about $\frac{1}{4}$ mm. broad, the outer margin of which is sharply defined from the surrounding clear corneal tissue. This band is encroached upon below by a small white speck. There are two rays, extending from the center to the periphery, formed by coalescence of the fine dots. The reproduction in black and white of the water color sketch shows the appearance of the lesion at the present time.

1819 Spruce Street.

POSTERIOR SCLEROTOMY AS A PRELIMINARY TO IRIDECTOMY IN SECONDARY GLAUCOMA.

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Posterior sclerotomy has been recommended as an adjunct or preliminary step to iridectomy in those cases of glaucoma in which the shallowness of the anterior chamber does not give sufficient space for the introduction of a knife without endangering the crystalline lens and for performing a satisfactory iridectomy. The authors¹ who devised this operation, or those² who speak of its utility, mention only cases of primary glaucoma, acute or chronic, in which it may be employed. Even in his recent article on this subject, Arnold Knapp³ wrote: "The cases which to me seem to require this preliminary operation are cases of primary acute glaucoma or chronic glaucoma, during an inflammatory attack when the eye is very hard and the anterior chamber so shallow as not to permit a satisfactory incision." Nothing is ever said by these of posterior sclerotomy in secondary glaucoma, which seems rather strange, as in cases of this form, requiring iridectomy, the same mechanical obstacles may exist which suggested this operation in primary glaucoma.

The only references I could find were these: W. Czermak⁴ enumerates, under the indications to posterior sclerotomy, "irritative primary and secondary glaucomas, in which the anterior chamber is totally abolished, in order to restore the anterior chamber for the performance of iridectomy." Nicati⁵ found that "it relieved the tension and pain, so that in some cases of total anterior synechiæ, leucoma adherens, time may be gained for a later iridectomy by

1. Mackenzie (William), *Treatise on Diseases of the Eye*, first recommended the operation in 1830. De Luca, *Annali di Ottalmologia*, 1872, p. 155.

2. Smith (Priestley), *Transactions of the Eighth International Ophthalmological Congress*, Edinburgh, 1894, p. 33, and in Norris and Oliver, *System of Diseases of the Eye*, vol. iii, 1898, p. 680, and the following speakers at the Edinburgh Congress in discussing Smith's paper: Parent, Paris; Pfüger, Bern; McHardy, London; Power, London; Menacho, Barcelona; Abadie, Paris. Nicati, *Archives d'Ophth.*, vol. xi, 1891, p. 168. Gifford, *Ophth. Review*, vol. xii, 1893, p. 248. Parinaud, *Annales d'oculist*, 113, 1895, p. 305. Berthaud, *Revue generale d'ophth.*, 1897, p. 173. Sattler, *Klinische-therapeutische Wochenschrift*, v, 1898, No. 46, p. 1587. Herman Knapp, *Operations Usually Performed in Eye-Surgery*, in Norris and Oliver, *System of Diseases of the Eye*, vol. iii, 1898, p. 856.

3. *Archives of Ophthalmology*, xxxv, No. 4, 1906, p. 340.

4. *Operations on the Eye*, p. 685.

5. *Bull. de la Soc. de Chir.*, 1881, p. 622.

restitution of the anterior chamber." and Simi⁶ performed it in a case of rupture of a corneal abscess with prolapse of iris and obliterated anterior chamber, followed by iridectomy two days later.

As from my experience I am convinced, and no doubt also others are from theirs, of the great value of posterior sclerotomy, indeed of the only thing to do, in certain cases of secondary glaucoma, I thought it worth while to make these supplementary remarks, strengthened by the following illustrative case:

Mrs. J. L. S. came to me on Oct. 6, 1894, with iritis of both eyes, which, she said, she had for about four weeks; numerous posterior synechiæ. Upon atropin the pupils were, on October 8, dilated, except the temporal portion of right and lower portion of left.

I did not see her again until Jan. 23, 1899, when V. R. was fingers at four feet, left 15/lxx. R. eye very much inflamed and painful, anterior chamber very narrow, seclusion and partial occlusion of pupil, T. + 3, L. partial seclusion and occlusion of pupil.

January 24.—Posterior sclerotomy in inferior temporal quadrant of right eye, under cocain anesthesia. T. and pain were at once relieved. January 25 doing well, no pain, tension normal. January 26 some pain in left eye, eserin. January 27 right eye soft, no pain, anterior chamber less shallow, eserin continued in left eye. January 28 V. R. fingers at fifteen feet.

February 1.—Iridectomy upwards with von Graefe's knife, scleral section, under cocain anesthesia, considerable bleeding. February 2 some blood in anterior chamber, tension normal, no pain, atropin. February 6 blood in anterior chamber absorbed, atropin; bandage left off, on account of irritation of eyelids from blepharitis ciliaris; applications of boracic acid. February 13 eye not red, fingers at 15 feet, tension normal. February 17 V. R. 15/cc, red ophthalmoscopic reflex, but no details visible, atropin continued. February 20 V. R. 15/c. May 2, 1899, V. R. 15/lxx, L. 15/c; operation advised on left eye.

May 10.—Iridectomy upwards with von Graefe's knife in left eye under cocain anesthesia. May 12 wound closed, anterior chamber filled with blood, angina tonsillaris, 103°. May 13, 103°. L. eye not painful, of normal tension, but anterior chamber still filled with blood; 104° at night, abscess of left tonsil. May 14 abscess of left tonsil incised, anterior chamber still filled with blood. May 15 throat better, last night 100°, this a. m. normal temperature. May 20 hyphema smaller, coloboma visible; had some pain in eye, which was relieved by salicylate of sodium, scopolamin. May 23 hyphema absorbed, scopolamin continued. June 1 V. L. fingers at eight feet; iodid of potassium internally. June 9 V. L. fingers at fifteen feet.

⁶ *Bollet. d. Oculist.* xv, 1893, No. 14.

June 13 V. L. 15, c +. June 20 excavation of left optic disc can be seen plainly, especially upwards.

In the large majority of Smith's cases, the iridectomy was made immediately after the scleral puncture. In a few cases of special gravity, there was an interval of several days between the two. In our case of severe chronic inflammation of the uveal tract, it seemed better not to subject the diseased eyeball to two operations at the same sitting. Therefore, the iridectomy followed a week later.

There is, however, a limit to this interval lest the benefit of the scleral puncture be lost. The effect of posterior sclerotomy is to be attributed not only to the relief of tension of the sclera as enclosing membrane, but also, as the experiments of Th. Tobler⁷ on rabbits, in the clinic of Prof. C. Mellinger at Basel, have shown, to the establishment of a free centrifugal current of liquid from the interior of the globe into the subconjunctival space. This, of course, will be terminated by the healing of the scleral wound, which Tobler found in rabbits to be completed on the eighth day, Krückmann from four to seven days. The clinical experience of the transient effect of scleral puncture, so that in some cases it had to be repeated, corresponds with these observations.

A lasting improvement by posterior sclerotomy has since been reported from Deutschmann's clinic by Boldt:⁸ "In a case of an acute attack of glaucoma with abolished anterior chamber, cyclodialysis did not materially diminish the tension, even after it was repeated ten days later. The anterior chamber remained obliterated until posterior sclerotomy effected a lasting improvement."

With regard to the mode of operating, the direction of the incision deserves some attention. While Smith "had as yet not discovered internal bleeding in any case," Tobler found in his experiments, ophthalmoscopically and anatomically, illustrated by very good pictures, that meridional sclerotomy caused a greater gap, but, being parallel to, and thus avoiding, the chorioidal vessels, less bleeding, and, therefore, is preferable to the equatorial section. To make the wound subconjunctival, the sliding of the conjunctiva is of great importance.

7. *Archiv. fuer Augenheilkunde*, 1899, 38, p. 93.

8. Recent Experiences with Cyclodialysis, *Beitrage zur Augenheilkunde*, Jussé, 1907, Heft 68, p. 478.

THE FOGGING METHOD APPLIED TO THE TREATMENT OF EYE-STRAIN.

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The procedure of blurring distant vision with convex spherical glasses and gradually diminishing their strength, in order to induce relaxation of accommodation, is well known to opticians as a diagnostic aid in the estimation of refraction error without the use of a cycloplegic.

As I have come across more than one colleague who was ignorant of the procedure or very hazy as to the details, I may be permitted to give a short review of the fogging method and its advantages for diagnostic purposes.

Instead of putting very weak plus or minus lenses before the eyes and gradually increasing their strength, the patient is made artificially myopic by a plus glass sufficiently strong to cause decided fogging. This fog is then diminished and the amount of artificial myopia reduced by successive weakening of the plus glass before the eye; weak minus spheres being used for this purpose until the point of correction of one of the meridians of the eye is reached, after which weak cylinders, one-eighth to one-quarter of a diopter, are used. The ciliary muscle is apt to relax in the interest of clear vision rather than to contract as the examination proceeds, so that more of the latent hypermetropia is made manifest. Of course, this relaxation is not complete, and there is no way of estimating its degree. It is claimed that the patient responds more readily to the questions when minus lenses are used to reduce a factitious myopia than when plus lenses are placed in front of the eye. The principal meridians of refraction are easily determined, as the far point of the meridian of least refraction is found and corrected while there is still some fogging of the opposite meridian. The use of plus cylinders to produce an artificial myopic astigmatism which is gradually reduced to the correction point by adding successively stronger minus cylinders also aids in the determination of low degrees of astigmatism by fogging one meridian and producing a contrast which would otherwise be lacking. Rotation of the cylinders is followed by a change in the amount of fogging if any astigmatism be present, while accommodation can only take

place at the expense of vision, and there is, therefore, no stimulus to accommodative action, as in using minus cylinders. In simple spherical error there will be no change in the amount of fogging when the cylinder is rotated. If a point is found at which there is clearer vision, the cylinder is placed with its axis at this point and gradually neutralized. Visual acuity may be below the normal or the astigmatic error may be so small that the patient is unable to say which lines of the astigmatic dial are seen most distinctly. If the very slightly blurred lines are now still further fogged by the cylinder, the difference in distinctness will become apparent to the patient.

To my knowledge no therapeutic application of this principle has been made, and certainly it is not common or systematized. In cases of eye-strain or visual defect due to ametropia, in which there is spasm of accommodation, the usual practice is to induce complete cycloplegia by means of atropin and to prolong the atropinization for a time in case of an extremely stubborn accommodative muscle. Correcting glasses are prescribed and worn under atropin, the latter wearing off as the glasses "wear on," and are gradually accepted. In many, in fact the great majority of cases, these methods are sufficient to bring about the desired end, viz., a relaxation of the accommodative spasm and acceptance of nearly full correction with subjective comfort. In a few cases, however, and these are frequently found to have only low degrees of ametropia—generally hyperopia with astigmatism—the accommodative spasm is inveterate and becomes manifest as soon as the effect of the atropin has disappeared, by a recurrence of the symptoms of eye-strain, inability to see well with the lenses which had been accepted willingly while the accommodation was paralyzed, or discomfort from wearing the glasses, without any diminution in vision.

No matter how careful the correction of ametropia, it is evident that it will not relieve the symptoms in such a case, and unless we are prepared to keep the patient under atropin indefinitely we may find ourselves confronted by a case of what the "newer ophthalmology" calls "incurable eye-strain." The disadvantages of the continued use of atropin mydriasis and cycloplegia are evident. The blurring of vision for near work, the inability to accommodate at all, the painful sensation of glare and dazzling interfere greatly with the patient's comfort. Besides this, there is an objection from the therapeutic viewpoint which, I believe, has not been pointed out. Cycloplegia acts as a splint, either putting the accommodation at rest completely, or like a splint which has come loose, requiring re-application. Now what we need in all spastic conditions is not to se-

much rest and immobilization as graduated exercises, light work and occasionally massage. All but the last can be applied to the muscle of accommodation by means of an overcorrection of the static refraction to the extent of a diopter or so, inducing a corresponding amount of artificial myopia and fogging of distant vision with accompanying stimulation, or rather suggestion, of relaxation to the accommodative mechanism. It is customary to allow about three-fourths of a diopter to one diopter of refraction for the normal tonus of the eye, and to prescribe a plus sphere that much weaker than the total error as found under atropin to insure the acceptance of the glass with good distant vision after the re-establishment of accommodation. The old rule tells us to give the strongest convex and the weakest concave glass with which the patient sees best. The fogging method, on the other hand, aims to keep the eye under an artificially relaxed accommodation and to keep up this suggestive action of the over-correction. Any accommodative action increases the amount of the fogging of distant vision, while accommodation for near work is assisted instead of being abolished. In this way the eye is allowed to do a certain amount of work without possibility of strain, and the advantages of a relaxation of accommodation are secured without the disagreeable features attending the use of atropin. My notice was first called to this application of the fogging system by a mere accident. A patient who had received from me a prescription for convex spherocylinders came back to have her glasses inspected after using them a few days, with the statement that she saw much better without than with the glasses, but that her head and eyes felt much better, and that the headaches for which she had had her eyes examined had completely disappeared. The plus spheres had been over a diopter too strong. One or two similar experiences with over-correction of hypermetropia and consequent cessation of symptoms of eye-strain in spite of blurred vision convinced me that we have in this procedure a valuable aid in the relief of eye-strain in those exceptional cases in which accurate and careful correction of ametropia and of any disturbance of muscle balance fails to relieve. It is well known that the very small degrees of astigmatism and of spherical error are those most likely to cause eyestrain; the higher degrees interfering with vision without, as a rule, causing functional disturbances or painful sensations. The basic reason for this is to be found in the attempts of the accommodative mechanism to correct the refraction error under the stimulus of a desire for perfect vision. This need does not impose itself when the vision is clouded by high myopia or astigmatism. The application of these facts to the treat-

ment of eye-strain would lead us to make more frequent, if temporary, use of over-correction and fogging in the treatment of eye-strain. It is advisable to correct the astigmatism fully, of course, after careful tests under full cycloplegia, with retinoscopy, the ophthalmometer and the ophthalmoscope. As the personal equation enters into each of these determinations, differences of an eighth or even a quarter of a diopter may easily be found in the estimation of refraction by two skilled and painstaking oculists, just as a slight muscular imbalance may be found by one competent observer in eyes pronounced normal, as to motility, by another. The logical deduction is that emmetropia is an ideal, and the practical lesson to be learned is that eye-strain is a reaction of the entire organism to optical defects, varying not only with one but with both factors. Thus, an error of refraction which causes headache, dizziness, dyspeptic manifestations and a whole list of troubles may take care of itself, as it were, when the subject has been gotten into good general condition. We have all come across patients who have made the rounds of all available oculists, and who have any number of prescriptions and spectacles by the bushel to show us. Each examiner has done his best to prescribe an accurately correcting glass, and we find differences of but one-eighth of a diopter or of one or two degrees in the axis of the cylinders on comparing the different glasses. The patients tell us that sometimes one glass relieves them and sometimes another, occasionally none. These are the cases which require, not the correction of ametropia down to three decimal places and cylinder axes estimated to half-degrees, but frank over-correction of the spherical error, blurring of distant vision and relaxation of accommodation in a natural way, to relieve spasm by easy gradual exercise rather than by immobilization. It is far from my intention to recommend this method as a usual or even frequent mode of procedure, but I do believe that it has its uses, and that, too, in a class of cases which are not benefited or but temporarily relieved by the usual treatment. With careful correction of astigmatism we may combine enough refraction excess, usually about one diopter, to reduce vision about one line of the Snellen chart—say, from 20/xx to 20/xxx, from 20/xl to 20/l, and so on, as the case may be. After the glasses have been worn for a time the over-correction may be reduced or entirely abolished and normal accommodation allowed to assert itself.

DIALOGUES OF AN EYE CLINIC.

BY PLATO MINOR, M.D.

[Illustrated.]

Clinical Professors—PROFESSOR EMERITUS, PROFESSOR AMIAS, PROFESSOR BRUSQUE.

Postgraduates.—DR. ROBINSON, DR. BROWN, DR. JONES, DR. SMITH.

PILLS, a druggist.

JULIUS, a negro janitor.

SCENE: An eye clinic; (waiting room, dark room, operating room, etc.).

DIALOGUE I.

Robinson.—Well, Brown, not much of a crowd to-day.

Brown.—No, but I wish Dr. Amias would let me operate on that old fellow with the lid tumor.

Rob.—O, that's too easy; Smith can have it.

Smith (quietly).—Anyhow, I can try it.

Enter PROFESSOR AMIAS.

Prof. A.—Good morning, gentlemen. Julius, show in a patient. (Enter Old Man; he has a large swelling of right upper eyelid.)

Prof. A.—Sit down here. Now, Dr. Robinson, examine this patient. First get a short history, examine the eye, then give your diagnosis.

Rob.—What is the matter with your eye?

Man.—Don't know; it's jest done gone and got swelled up. Came here to find out.

Rob.—Does it hurt?

Man.—Naw, but it did at first.

Rob.—What are you doing for—

Prof. A.—Hold on, Doctor; you should get the history in its order. (To patient): How long has it been since your eye was all right?

Man.—'Bout two months.

Prof. A.—Go on, Doctor, but try to get things in their order.

Rob.—Two months? What did you do for it?

Man.—Put some tea leaves on it.

Prof. A.—Now, Dr. Brown, ask some questions.

Brown.—Have you had a doctor?

Man.—Naw, just tried the tea leaves myself.

Brown.—Did they help you?

Man.—Yep. They's made the pain stop, but the swellin' stays.

Prof. A.—Dr. Jones, your turn.

Jones.—I-er, don't know just how I should question him.

Prof. A.—Oh, imagine you are in your office.

Jones.—Er—how's your health?

Man.—Pretty fair; got rheumatiz some.

Jones.—Where?

Prof. A. (in despair).—Doctor, you have gone off the track a little. Dr. Smith, try your hand.

Smith.—You said that the eye trouble began about two months ago. What did you notice first?

Man.—Well, my lid got itchy and sore and began swellin'.

Smith.—When you put the tea leaves on, what effect did they have?

Man.—Took the pain away, only the lids stuck together in the morning. But say! The lump's gettin' harder and harder!

(Smith everts the right upper eyelid. Palpebral conjunctiva shows a bluish-purple spot corresponding to situation of tumor.)

Prof. A.—Dr. Robinson, what is your diagnosis?

Rob.—A tumor of the lid.

Prof. A.—Evidently. Dr. Brown, what is your diagnosis?

Brown.—It is an epithelioma.

Prof. A.—Dr. Jones?

Jones.—It looks like a sty.

Prof. A.—Dr. Smith?

Smith.—I believe it is an infection of a small gland.

Prof. A.—Perhaps; but what kind of a gland?

Smith.—A Meibomian gland; one of the glands of the tarsus.

Prof. A.—Yes; this is a case of chalazion. According to modern authority, a chalazion is a tumor involving a Meibomian gland, but is rarely a retention cyst. The general health has much to do with its occurrence and is a predisposing cause, but some germ infection seems to be the exciting cause.

The contents of the cavity, which is large in this case, are pus and so-called granulation tissue. Sometimes the contents tend to break through the conjunctiva; sometimes it thins the tarsal cartilage. In either case evacuation by incision is indicated. If we incise the conjunctiva, we do so by an ample crucial incision and curette out the granulation tissue with a sharp spoon.

If the tarsus is thinned, the lid is to be enclosed in a lid clamp and a horizontal incision made over the tumor, the *orbicularis mus-*

cle pushed aside so as to expose the tarsal tumor, which is then split horizontally with a scalpel as you see me do. Then each tarsal flap is grasped in turn with forceps and cut off with strong, sharp scissors. The skin incision is then closed with sutures. By some it is thought that these tumors, like styes, are caused by eye-strain. Anyhow, I will ask Dr. Smith to make a skiascopic examination of this man's other eye and report what he finds next Wednesday.

DIALOGUE II.

(Jones is examining the eyes of a young woman.)

Prof. A.—What do you find, Doctor?

Jones.—Her eyes are discharging matter. She says they do so every now and then.

Prof. A. (to woman).—What is your occupation?

Woman.—I take in sewing.

Prof. A.—Do you sew at night?

Woman.—Yes, sir.

Prof. A.—Do your eyes get tired?

Woman.—Yes, sir.

Prof. A.—Doctor, what do these answers mean?

Jones.—I suppose that she strains her eyes.

Prof. A.—What questions have I failed to ask?

Jones.—I don't know, sir.

Prof. A. (to patient).—Is your general health good?

Woman.—Yes.

Prof. A.—Do you eat and sleep well?

Woman.—Oh, I eat plenty, but I don't sleep well.

Prof. A.—What time do you go to bed, and what time do you wake up?

Woman.—I go to bed usually at 11 or 11:30 and get up at 6.

Prof. A.—How old are you?

Woman.—Twenty-two.

Prof. A.—Six and a half to seven hours' sleep is not enough for you. Doctor, make some trial-case tests and report to me. Dr. Smith, have you finished your skiascopic tests of the man with the chalazion?

Dr. Smith.—Yes, sir; but I find the case a hard one.

Prof. A.—Well, I will try the tests with you.

(They go with Robinson and Brown into the dark room. Patient is sitting on stool near a swinging bracket with iris-diaphragm asbestos chimney, and has a + 2.50 sphere lens before left eye. Prof. A. seats himself about $\frac{2}{3}$ meter, or 1.50 D., from patient.)

Prof. A.—I have here a plane mirror of small diameter. (Throws

light into the partially dilated left pupil.) No, this is not exactly an easy case. There is high positive spherical aberration and astigmatism.

Brown.—But why should that make it difficult?

Prof. A.—Try for yourself. (Brown takes up a plane skiascopic mirror of one inch diameter and, sitting one meter away, throws the light into the pupil.)

Brown.—I find myopia.

Prof. A.—Move nearer. (B. moves to 1.50 D. distance.)

Brown.—I get myopia yet.

(Prof. A. tries a $\frac{3}{8}$ inch mirror at 1.50 D.) The movement near the center of the pupil is hyperopic; that is, *with* the light on the face, but it is faster in the horizontal meridian.

Brown.—Why did I see a movement everywhere against the light on the face?

Prof. A.—You sat too far away, your mirror is too large, and you turned it too far from side to side. The spherical aberration char-



Figure 1.

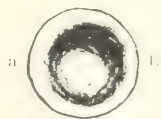


Figure 2.

which I mean that the refraction is more myopic or less hyperopic near the edge of the pupil than at its center) causes a movement *against* that of the light on the face at and near the edge of the pupil, and *with* it, at or near its center. Sitting as far away as you did, you could not see the small area of light moving in this so-called (Edw. Jackson) visual zone (or dioptric path, as I prefer to call it).

These sketches (drawing on blackboard) show what I mean. A. shows the life-size appearance of the pupil of this man seen at a distance of one meter. If the oculist has a high visual acuity, even then he can only see the small area of light, provided his plane mirror is small and is rotated very slightly, and perhaps not even then. a and b show the appearance and size of the same pupil at 2 diopters' distance. The central area now appears quite large enough to be seen moving *with* the light on the face in the horizontal meridian. As this patient has a 2.50 D. lens before the eye, it follows that I am nearer than the point of reversal of the rays of light coming from the horizontal meridian of his retina. Now I move

back to 1.75 D. by the tape. Here there is no movement in the horizontal meridian. Hence I conclude that its refraction is 2.50 minus 1.75, or 0.75 D., which is its manifest refraction. It may be more under a cycloplegic.

Brown.—But why do you use so small a mirror, and why do you keep the light so close to it?

Prof. A.—There are two conditions absolutely necessary to secure accuracy. As only the light reflected from that part of this little mirror which is close to its perforation enters the pupil near its center, it is only when the light is thrown from this part that the small area of light is seen, and it is the movements of this area which determine the refraction.

I make the hole in the iris-diaphragm of this chimney only about five millimeters; hence I must be close to it so as to get enough of

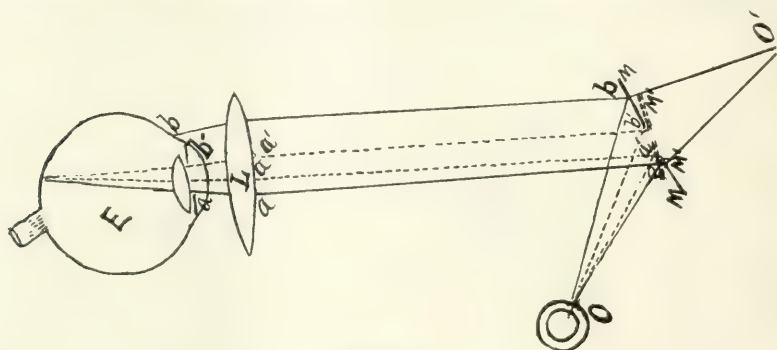


Figure 3.

light and also so that the apparent source of light (which is exactly as far behind my mirror as the light itself, the flame) is thus kept as close as possible to my eye. This makes my tape measurement more accurate.

Robinson.—What is the objection to a large mirror?

Prof. A.—With it the pupil may be illuminated, yet the light from near the perforation enters the pupil at its edge, especially when the latter is dilated by a mydriatic. (Draws on blackboard.) Here, this will explain what I mean (Fig. 3). *O* is the original source of light, the flame; *o* the apparent source of light behind the mirror. *a* is one point on the one-inch mirror, *M*, at some distance from its perforation, and *b* another. Now, at the angle the mirror is represented, the light reflected from *a* enters the pupil at and near its inner edge, where, owing to the spherical aberration, the shadow movement is myopic. The light reflected from *b* does not even enter the pupil. No small central spot of light is, therefore,

visible and the beginner is deceived, just as you have seen. But, if we take a small $\frac{3}{8}$ -inch mirror with a perforation of, say, two millimeters, and, at the same distance, turn it slightly ($M' M'$), we see at a distance of 2 D. the small light area or spot moving with the light in the face in the horizontal meridian, and at 1.75 D. there is no movement at all in this meridian. Vertically it still moves against the face light until I put a — 0.50 cyl., axis 180 degrees, in the trial frame.

Now, at 1.75 D. by the tape, there is no movement, in any meridian, of the small light spot. What is the manifest refraction?

Rob.—Plus 0.75 sphere combined with a — 0.50 cylinder, axis 180.

Prof. A.—Correct. As this patient is 55 or 60 years old, we can estimate that for reading he will require what lens, Dr. Brown?

Brown.—Well, I don't know what plan you order that lens on.

Rob.—We have to consider the range of accommodation, don't we?

Prof. A.—Yes. (To patient)—How old are you?

Patient.—'Bout 52.

Prof. A.—Here is a Prince's refraction ruler. Under the number 50 is marked 2, which is the range of accommodation for that age. For age 52 the normal range is 1.50 diopters. A good practical rule is to add $\frac{1}{3}$ of this to the difference between it and 3 D. (13 inches) which is the average reading distance. In this case $\frac{1}{3}$ of 1.50 is .50, to which we add 1.50, this being the difference between 1.50 and 3. The total gives a + 2 D. sphere, to which we add the — 0.50 cylinder; now, is this the proper reading lens for this man?

Brown.—Yes, sir.

Prof. A.—No; for we must add the amount of his hyperopia, which is 0.75 D.; this makes the correct reading glass + 2.75s \ominus — 0.50 cyl., axis 180. This, however, must be verified subjectively with trial case lens tests. (To Dr. Smith, who has entered)—Well, Doctor, what did you find?

Smith.—That girl takes only minus lenses.

Prof. A.—Tell her to come back on the next clinic day.

(Enter Professor Brusque.)

Prof. B.—Hullo! Amias, my clinic begins to-morrow. (Exit postgraduates.) I see you still stick to that trifling little plane mirror method. I don't see but that the ophthalmoscope skiascopic method is just as good, and it is certainly easier.

Prof. A.—Perhaps; I admit that some men can get fair results with it, but I deny that it is as accurate a method as we get with this little "trifling" mirror and the light close and coming through

a small perforation in the chimney. A concave mirror suits your curves, anyway. (Exeunt, conversing.)

DIALOGUE III.

(Same place. Professors Emeritus, Amias and Brusque are examining the eye of a little girl about 5 years old.)

Prof. B. (examining child's right eye).—I'll wager this is a case of glioma. You can see the cat's-eye reflex.

Prof. A.—Yes, but the tension is very low.

Prof. Emeritus (with ophthalmoscope).—Why, man, I can plainly see the tumor and the blood vessels running over it.

Prof. A.—Enucleation of the eye of so young a child, and a girl at that, means arrested development of the orbit and lasting deformity. I want to be certain. Probably enucleation will have to be done sooner or later, but unless a malignant tumor can be proved with some certainty to be present the deformity will be less the longer the eye is not removed.

Prof. B.—The child's aunt says there has been no injury; there is no tubercular history in the family and no sign of uveal trouble, so I won't take the risk.

Prof. A.—On the other hand, her uncle is positive that the sight of this eye was defective over a year ago; the child complained of this. A glioma destroys the eye, and generally the life, much sooner. Now, see here; as I am the youngest of the three of us, I give my opinion first, which is to wait.

Prof. B.—Oh, bosh! I say enucleate at once—won't take the risk; it's my case. What is your opinion, Professor Emeritus?

Prof. E.—Um—ah! Well, well, you see there may be, as Brusque says, too much risk in waiting. Ah—er! Better have the eye out. I say.

Prof. B.—That settles it. I'll enucleate to-morrow.

Prof. A.—All right. But I say, Brusque, let's have a pathologist's report after the enucleation.

Prof. B.—Certainly; it will satisfy the relatives and I'm sure I'm right. (Exeunt.)

DIALOGUE IV.

(Same place. Rooms crowded with patients and postgraduates. Much bustle; all assistants busy.)

Enter PROFESSOR BRUSQUE.

Prof. B. (to Julius).—You darned nigger, you're too lazy to live! Why don't you keep the passageway clear?

Julius.—'Deed, Professor. I'se done the best I could.

Prof. B.—Well, let's see what's going on. Here! (to a patient) hold your eye open. Don't squeeze all the drops out as soon as they're put in. There; go to the desk. Dr. Smith, give this woman prescription No. 6. Dr. Robinson, take that probe out. Come again Friday. Yes, yes, the medicine will smart awhile, but it will cure you. Hurry up there, gentlemen, there are ten more to be seen yet and it's late.

Smith.—Professor, how much of No. 6 shall this patient use?

Prof. B.—O, tell her to use about five drops. (In a low voice): It's only borax in camphor water.

Robinson (examining an old man's eye by oblique illumination, to himself).—Blamed if I can see anything wrong. Professor, will you please look at this case?

Prof. B.—Haven't time; tell him to come Friday. (Exit.)

Smith.—Bring him into the dark room, Rob., and we'll try the ophthalmoscope. (The three go into dark room.)

Smith (using plane mirror).—There seems to be no opacity of the lens (gets closer). But the vitreous is hazy (takes tension). The eye is hard. Have you had any pain in this eye?

Old Man.—Yes, some; I've had turrible neuralgia in the head on that side.

Smith.—Better examine the disc, Rob.

Robinson (uses ophthalmoscope).—By gum! The pupil is big enough. My! There's a hole in the disc. Don't make out what that means.

Smith (takes ophthalmoscope and looks at fundus).—Well, Rob, don't you know what that means?

Rob.—No.

Smith.—Chronic glaucoma.

Rob.—By gum!

Smith.—How's the other eye, my friend? Is it good as ever?

Old Man.—Seems to be; sometimes it gets weak and waters.

Smith.—Do your glasses seem to be all right?

Old Man.—I can read pretty fair with them in the day, but not at night. Now and then things looks like I saw them through smoke.

Smith (palpating globe).—The tension seems normal.

Rob.—Well; that shows there's no glaucoma.

Smith.—The tension may go up and down. Let's test his vision. (They go into the clinic room. Smith makes tests.) He only has fingers at three feet in the right, and reads half of 20 xxx with the left.

(Enter Pills with specimen in bottle.)

Pills.—I see Prof. Brusque has gone, so please see that he gets this specimen. Dr. Kyrogel has just sent it. (Exit.)

(Enter Prof. Brusque.)

Prof. B.—Has either of you gentlemen seen my gloves? Hullo! What's that specimen? (Takes up bottle.) From Kyrogel. (To himself): Well, well, it's not a glioma, eh? (Reads writing): "Detachment of retina complete; of chorioid partial. No tumor found. Appears to be a simple detachment from chorioiditis." Whew! Amias was right after all! (Exit.)

Abstracts from Recent Ophthalmic Literature.

AMBLYOPIA AND BLINDNESS.

RELAPSING MOMENTARY BLINDNESS.—JACQUEAU (*La Clinique Ophthalmologique*, May 25, 1907). Through medical or ophthalmic literature but few reports are found of transitory amblyopia with or without scotomata. A study of some of these was made by Antonelle in 1892. But reports of total momentary blindness are exceedingly rare if hysterical amaurosis, which is well known, is eliminated.

Mirabeau's letter to the father of Demours is well known. "There occurred to me at 6 in the morning, having written about a quarter of an hour, absolute blindness. Nothing but a headache had preceded this, which was very severe on rising. When my momentary blindness had disappeared, objects are seen as through a fog; I see nothing clearly." Galczowski has reported a case of complete blindness of the left eye lasting twenty minutes. Tardieu saw this condition last three days. Fratini cites the case of a neuropathic who remained blind two days after an excess at the table. Kip reported another case in which the blindness lasted thirty-six hours. Gayet, in 1893, published observations on the case of a young man who had had four attacks of amaurosis varying in duration from twenty-four hours to four and five days. In all of these cases the blindness existed relatively a long time and in none of them, save the case of Gayet, did it recur. But Jacqueau made special reference in his paper to those cases of absolute momentary recurring blindness of short duration—of veritable crisis in which the blindness resulted as a consequent. Jacqueau reports four cases. B. E. F.

COLOR-BLINDNESS WITH SPECIAL REFERENCE TO ART AND ARTISTS.—AYERS, EDWARD A. (*The Century Magazine*, April, 1907). gives a clear and somewhat figurative description of the anatomy of the eye, particularly of the retina, which may be said to contain 130,000,000 nerves connected with the rods and 7,000,000 with the cones. The most satisfactory and plausible theory of color vision is that the rods and cones are the special nerve fibrils which interpret the vibrations of light and color; that the rods interpret light in its purely luminous phase; that the cones interpret colors and distinguish them by the length of their respective waves, and that the many shades which are the product of mixed colors are likewise

recognized by the lengthening or shortening of the wave lengths. There is a definite length to the vibration waves of the six primary colors. Red, the longest, is $1/36000$ of an inch in length, and violet, the shortest, $1/61000$ of an inch. All waves that are longer than 36,000 to the inch (red) or shorter than 61,000 to the inch (violet) are invisible. There are waves longer than the red, called infra-red, unknown and electric, and waves shorter than the violet, called ultra-violet, and Roentgen rays. Through the fluoroscope, which retards the speed, the eye can see some of the ultra-violet rays, and the infra-red rays can be felt as heat.

He shows that "after images" and purely subjective sensations of light or color due to the temporary paralysis of the cones of a certain color, resulting in the appearance of its complementary color, may partly account for many marvelous tales in human experiences.

The writer assumes that each of the primary colors has its own set of cones and explains the results when the cones which see certain colors are left out, and only the luminosity remains, resulting in gradations of light and shade, as shown in the way a photograph shows a landscape, e. g., yellow is very luminous, and shows comparatively white in a photograph, and violet, being slightly luminous, appears very dark. The eye that is color-blind, if it beheld a yellow-green, would see the yellow with the admixture of gray represented in the luminosity of the green, making a dirty yellow. Green would be shown in a photograph by a gray that is about half-way between black and white. Generally there is some sense of a color felt; not all the cones of a color are wanting. Then there will be a tinge of such color in the effect.

The author relates several amusing and some disastrous incidents resulting from color-blindness. After discussing the color-blind artist's trained discernment of even slight variations in luminosity, he states this law: Variations in light illuminating colors do not alter color impression with normal eyes, only intensifying the color sense in brighter light; but with the color-blind they alter the shade itself. The majority of the color-blind will be color-true in observations of bright natural objects, but still color-blind in pigments. The writer describes the attempts of color-blind artists to reproduce in their pigments pure spectral colors and the appearance of objects in Nature to the color-blind artist.

M. D. S.

POSTOPERATIVE INTRAOCULAR HEMORRHAGE RESULTING IN TOTAL BLINDNESS AND DESTRUCTION OF THE EYEBALL.—BRAY, AARON (*American Medicine*, May, 1907). There have been but 75 cases of postoperative intraocular hemorrhages reported. The author's case

was that of a weak, nervous woman suffering from pain in the joints, headache and gastric disturbances, left eye blind for forty years from some inflammatory condition, right eye linear corneal opacity 4 mm. in length, situated horizontally below the pupil; eye quiet: pupil dilated; does not react to ordinary light, but reacts to concentrated light; anterior chamber well preserved; cornea hazy, tension plus 2, slight greenish lenticular reflex. Ophthalmoscopic examination revealed an entire opaque lens in the right eye, no view of fundus light, projection good. Diagnosis, hypermature cataract, extraction advised. Some preliminary treatment was given to tone up her general condition and a weak solution of eserine instilled in eye twice daily.

Immediately upon making the corneal section, the lens was forced out by the intraocular pressure, some vitreous escaped, and the anterior chamber collapsed. The vitreous was somewhat liquefied. No iridectomy was done, but the speculum was at once removed and the eye bandaged. A little pain was then complained of in the supraorbital region, which, seven hours later, had become severe; the patient was restless, nauseated, had vomited several times, and the bandage was soaked with blood. The eyeball was found filled with blood, but the wound was not opened. The bandage was re-applied and a hypodermic of morphine given. The next morning the bandage was clean, but eye still painful. Two hours later the patient attempted to go downstairs and was seized with vomiting and acute pain. Severe hemorrhage again occurred, the wound gaping with dark clots of blood, separating its edges. The patient went to the hospital and panophthalmitis developed. Sudden attacks of nausea, vomiting and severe pain in the eye with the appearance of blood on the dressing is the characteristic clinical picture.

In the 75 cases found in literature, it occurred mostly within one hour after the operation; some occurred as soon as the corneal incision was completed, even before the removal of the cataract; some occurred 24 hours after the operation; while others occurred three days after the operation. Only in two cases did the hemorrhage follow iridectomy for the relief of glaucoma, a fact that speaks against the theory that the hemorrhage is caused by a sudden reduction of a high intraocular pressure. The cause is undetermined.

M. D. S.

ANOMALIES.

COLOBOMA OF THE LID, WITH ANOMALOUS CONDITION OF THE TISSUES AT THE OUTER COMMISSURES.—POSEY, WILLIAM CAMPBELL, Philadelphia (*Ophthalmic Record*, April, 1907). A girl of

10 years of age presented a congenital absence of a portion of the upper eyelid of the left eye, so that, when the eyes were directed straight forward, the cleft just corresponded to the size and shape of the upper third of the cornea. The eyelid was in no other way deformed except for a small yellowish thickening in the skin, just above the coloboma, which resembled a xanthelasma. The eyeball was normal, except for an anomalous formation of Tenon's capsule at the outer angle of the eye. Bulbar conjunctiva covered this mass, which was grayish-white in color and everywhere smooth and flat. When the eye was rotated inward and separated, the anomalous formation assumed a cylindrical, sausage-like form and was readily movable over the globe. Both eyes were quite hypermetropic. Vision equally 5/x in each. The author outlines a plastic operation that he intends performing for the correction of the lid defect. M. B.

TEROMORPHIA IN THE EYE OF A CHILD.—BERGMEISTER, Wien (*Graefe's Arch.*, B. lxx, H. 1, December, 1906). In the histological examination of the eye of a deceased child Bergmeister came accidentally upon a hyperplasia and folding of the retina not heretofore described. The findings are summarized as follows: (1) Penetration of mesoderm into the eyeball through an opening in the pigment epithelium, situated beneath the papilla; a large sagittally coursing fold in the pars optica retinae in the inferior half of the globe; a fold in the pars optica retinae before its transition into the pars ciliaris; (4) a union of this with the sagittal fold into a convolution behind the lens; a peculiar mesodermal process originally in the pars plana of the ciliary body; a retinal fold surrounding the papilla; (6) complete absence of the macula and fovea; a scanty sporadic development of rods and cones and of the external and internal granular layers and ganglion cells; extension of vessels from the mesodermal fold into the granular layers; peculiar palli-sadal processes of the ciliary epithelial cells; tendency to overgrowth of the pars ciliaris retinae into papillomatous formations; (12) high grade involution of the pars ciliaris retinae, in one of the involutions a blood vessel coursing. The analogy between these findings and those of a normal fish eye are those enumerated in paragraphs 1, 4, 6 and 12. The differences are that the retina had overgrown all of the mesodermal processes, whereas in fishes the retina is simply broken through. W. Z.

CONTRIBUTION TO THE CASUISTICS OF ANOMALIES OF THE IRIS.—NATANSON, A. N., JR., Moskau (*Klin. Monatsblaetter fuer Augenheilkunde*, xlv, Maerz, April, 1907, p. 369), reports the following rare and interesting anomaly of the iris in a glaucomatous eye of a

woman, aged 53: The oval pupil is excentric and extends from the center obliquely outwards and downwards to the temporal periphery of the iris. Almost the whole lower half of the iris is lacking except a small seam in the periphery. The pupil is surrounded by a pretty wide border of iris tissue, containing the sphincter, which contracts upon light and eserine. From this border six thin bands extend to the peripheral small seam upwards and inwards, two of which communicate by two anastomoses. These bands circumscribe nine total defects of the iris, which are larger than the remnants of iris. In the whole area of the lower large defect the border of the lens is clearly visible. Although the patient did not remember having had them from early childhood, they are, in all probability, atypic colobomas and the condition may appropriately be termed "dehiscences of iris tissue."

C. Z.

A CONGENITAL ANOMALY OF THE SCLERA: "PSEUDO-COLOBOMA."—HAY, PERCIVAL J., Sheffield (*Ophthalmoscope*, June, 1907). A still-born child at full term presented the following anomalies: An hydrocephalic head of enormous size, double harelip and a complete cleft palate, malformed right ear with imperfect external meatus, with malformed left ear and no external meatus, also an accessory auricle on this side. The eyes presented the appearance of an absence of the sclera over a small area on each side of the cornea of the right eye and on the temporal side of the cornea of the left eye. This appearance was due to an extreme thinning of the sclera in this area allowing the underlying ciliary region to show through.

M. B.

A CASE OF CONGENITAL, UNILATERAL, ISOLATED FISSURE OF THE UPPER EYELID (BLEPHAROSCHISIS).—MEYER, L., Berlin (*Berliner Klin. Wochenschr.*, 1907, No. 20, p. 632). The coloboma of the left upper eyelid of a child, aged $2\frac{1}{2}$ years, was $\frac{3}{4}$ cm. high, $\frac{1}{2}$ cm. wide, triangular, with base on the ciliary margin. The borders of the fissure had no cilia. Meyer performed a plastic operation analogous to Malgaigne's for harelip, which healed within eight days by first intention. The affection may have been due (1) to incomplete closure, in the first few weeks of fetal life, of the primary fissure between medial and lateral portions of the frontal process; (2) in the third month a transient adherence of superior and inferior lids takes place, which is severed shortly before birth. During this process the previously adherent epithelial covering receded atypically and caused the fissure; (3) the completely formed eyelid may have been distended by amniotic bands and synechiæ. This view, however, is rejected, as the borders of the

defect had no cilia. The isolated colobomas of the lids are rather rare. The affection is illustrated by drawings. C. Z.

BACTERIOLOGY.

NOTE ON THE BACTERIOLOGY OF CONJUNCTIVAL INFLAMMATION.—LUEDE, W., St. Louis (*Am. Jour. of Ophth.*, July, 1907), presents a résumé of practical clinical observations of over 600 cases of conjunctival and corneal disease, carried out mainly at the Fondation Rothschild in Paris, where smears of the conjunctival secretions are examined bacteriologically in every new case. In doubtful cases, cultures and inoculation tests were made. The diplobacillus was found in about 23 per cent. of cases, mostly acute conjunctivitis. Zinc solutions were found particularly effective in this form. The xerosis bacillus was present in about 20 per cent. The bacillus of acute epidemic conjunctivitis of Koch-Weeks was seen in 14 per cent. of dispensary cases, but infrequently in a series of private patients. Staphylococci are generally saprophytic. P. H. F.

PSEUDO-MEMBRANOUS CONJUNCTIVITIS CAUSED BY STAPHYLOCOCCUS AUREUS AND ALBUS.—JOHNSTON, RICHARD H., Baltimore (*Ophthalmic Record*, June, 1907). A child, 9 months old, at the termination of an attack of measles, developed an inflammation of the conjunctiva of the left eye, with swelling of the upper lid and profuse lachrimation. On opening the lid there was a discharge of sero-purulent fluid, and on everting the lids the palpebral conjunctiva was found covered with a pseudo-membrane of a whitish color. This membrane did not continue beyond the fornix and was readily stripped from the part with forceps. Cultures showed the presence of the *Staphylococcus aureus* and *albus*. No other organism was found. The child was lost sight of before the eye recovered.

M. B.

DO THE STAPHYLOCOCCI BELONG TO THE ENCAPSULATED BACTERIA?—NICOLAI (*Tydschr. v. Gen.*, Aug. 11, 1906), cultivating bacteria from cilia from blepharitis cases, found with the always-present staphylococci (albus or aureus) other micrococci, which remained with the ordinary staining uncolored or very little colored. It was impossible to separate them; they always were found together. One specimen from ascites-agar showed the colored and the uncolored exactly next to each other, sometimes partly covering each other, which made him think that the colored came from the uncolored; that these last ones were the capsules. They disappear from all specimens. Nicolai found no mention of these capsules

in the literature: a few writers mention that the bacteria are not stained equally well.

E. E. B.

AN ACCUMULATION OF BACTERIA ON THE CONJUNCTIVA. — TERTSCH, R. (From the eye clinic of Prof. E. Fuchs in the Univ. of Wien. *Beitr. zur Augenheilkunde*, 1907, Heft 68, p. 411.) A man, aged 38, noticed, two years ago, a small white spot on the temporal side of the right eyeball, which gradually became larger. It was scraped off by a surgeon, but returned after two weeks and grew larger, although it was touched with a 2 per cent. solution of nitrate of silver. When he came to the clinic, the conjunctiva of the lids was injected and swollen, the globe slightly injected. At the usual site of the lateral pinguecula a whitish prominence 1 to 2 mm. high, of the form of an isosceles triangle, covered the limbus over 7 mm., encroaching upon the cornea and ending with an irregular border at the upper corneal margin. The apex of the triangle, 10 mm. distant from the limbus, turned to the temporal angle of the lids. It looked like a neoplasm, similar to a drop of stearin, and was movable with the conjunctiva. A few dilated conjunctival blood vessels were running to it, otherwise the eye was normal. Microscopically it consisted of an accumulation of densely crowded bacteria, interspersed on some places with fibrous or amorphous masses, staining red with fuchsin, dark blue with Gram, in which here and there the outlines of epithelia were recognized. It was easily washed off with soap from the conjunctiva, but from the cornea it had to be removed with a lance-shaped knife. The cornea at this place was uneven and without luster and showed some epithelial defects. The bacteria were Gram positive and belonged to the diphtheria group. The morphological and cultural examinations revealed Hoffmann's bacilli and pseudo-diphtheria bacilli, those two saprophytes of the conjunctiva similar to diphtheria bacilli, generally classed as xerosis bacilli. Probably the affection was a circumscribed form of parenchymatous xerosis, which had developed on the soil of a pinguecula. Tertsch could find only two similar cases in literature.

C. Z.

ULCERATION OF THE CORNEA FROM THE DIPLOBACILLUS OF MORAN-AXENFELD.—McKEE, HANFORD, Montreal (*Ophthalmic Record*, April, 1907). Three cases are reported of corneal ulceration, with hypopion, caused by the diplobacillus. Prompt recovery followed in each case upon the use of weak solutions of zinc sulphate. The fourth case was a child of 7 with central corneal ulcer caused by the diplobacillus which cleared up in a week under the use of zinc. Three other cases are reported of laborers who had a

diplobacillary conjunctivitis and had been struck on the cornea with a foreign substance. Ulceration of the cornea followed, but in each case the ulcers cleared up quickly under zinc sulphate. In all these cases the same technic was followed. The ulcerated surface was stained with a solution of fluorescein, then with a keratome, some of the pus from the surface of the ulcer was removed, tubes of serum and agar were inoculated and smear preparations were made. In all these cases the factor was diplobacillus of Morax-Axenfeld. In some of the cases other methods of treatment were tried without avail and improvement only followed the use of zinc. The cases were treated by instillation of drops of the sulphate of zinc, $\frac{1}{4}$ gr. to the ounce, four or five times daily; between times the surface of the cornea and the conjunctival sac were flushed with warm boric solution and the solution of sulphate of zinc. At night a little boracic ointment was smeared along the edges of the lids. Scopolamin was used as a mydriatic.

M. B.

THE PRESENT POSITION OF THE SPIROCHÆTA PALLIDA IN RELATION TO SYPHILITIC AFFECTIONS OF THE EYE.—STEPHENSON. SYDNEY, London (*Ophthalmoscope*, June, 1907). The author considers the name *treponema pallidum*, as suggested by Vuillemin, to be more appropriate than *Spirochæta pallida*. The organism has been found in all forms and stages of syphilis, whether acquired or inherited, human or animal. It has also been demonstrated in the blood of hereditary syphilitic cases and of those passing through the secondary stage. The *treponema* has not yet been found in non-specific lesions and it has not yet been cultivated outside the animal body. The advance that has been made from an ophthalmic standpoint is: (1) The discovery of the *treponema* in the apparently healthy eyes of fetuses and of infants who have died from congenital syphilis. (2) Its discovery in lesions set up experimentally in the eyes of monkeys and rabbits by the inoculation of syphilitic material, such as chancres or diseased glands. (3) Its discovery in actual syphilitic invasions of the human eye. The author has found the *treponema* in the aqueous humor of a woman afflicted with iridocyclitis in the course of the early secondaries. He has also found the organisms in scrapings from the corneæ of three cases of keratomalacia in syphilitic infants. The author thinks the conclusion is inevitable that in the discovery of Schandinn's organism we have the strongest possible proof of the syphilitic nature of any given disease of the eye.

M. B.

CATARACT.

UNUSUAL FORM OF HEREDITARY CONGENITAL CATARACT OCCURRING IN SEVERAL MEMBERS OF A FAMILY.—CHANCE, BERTON. Philadelphia (*Arch. Ophthalm.*, July, 1907, xxxvi, 505). The author reports a peculiar variety of congenital cataract occurring in five members of a family. The opacities were disc-shaped, thin, symmetrically placed in both lenses, sharply defined from the clear lens substance surrounding them, were apparently situated between the nucleus and posterior pole, and appeared to be stationary. The author refers to a report of a similar form of cataract described by Nettleship and Ogilvie.

W. R. M.

A CONTRIBUTION TO THE DOCTRINE OF ZONULAR CATARACT.—RUHWANDL, F. (From the eye clinic of Prof. C. Hess in the Univ. of Würzburg. *Ztschr. fuer Augenheilkunde*, xvi, May, 1907, 404-402), reports in detail the clinical histories of six cases and the anatomical changes of ten lenses extracted from them. There was a distinct separation of nucleus and cortex in all but one. In eight, the nuclei were changed in the same manner, viz.: foci, of the size of 4 to 10 mm., were equally distributed in the lens substance. The perinuclear zone consisted of a dense accumulation of innumerable fine and coarse dots and foci. In equatorial sections these changes encroached upon neighboring lamellæ of the lens in form of pointed wedges and sectors. The microscopic conditions did not support the assumption that shrinking processes play any part in the development of zonular cataract. The peripheral portions of the lens showed various changes, under which the so-called riders are to be classed.

With regard to etiology, Ruhwandl does not consider the cases gathered from literature, for which the authors claim a postfetal origin, as of sufficient proof. Numerous observations taught him that not a small number of slight, not much saturated, zonular cataracts can only be recognized after dilatation of the pupil and by very exact methods of examination. It is also a long-established fact that the intensity of opacities in zonular cataract may increase without any known cause. Thus only such cases can be utilized in favor of postfetal origin in which careful examinations disclose an opacity of the lens before the development of zonular cataract.

Ruhwandl is an adherent of the opinion of Hess, who considers, at least in the majority of cases, zonular cataract as a congenital affection, due to a faulty or belated separation of the lenticular vesicle, and supports it by the following arguments, illustrated by cases observed in the clinic of Professor Hess and collected from

literature: Hereditary conditions. frequent complication with other kinds of cataract long ago regarded as congenital, as fusiform, posterior and anterior polar, central, capsular, aridosiliquata, total cataracts, and with other malformations of the eyes, as coloboma of the lens, iris and chorioid, irideremia, aniridia, perseverant pupillary membrane, ectopia of the lens, orbital cysts, microphthalmus, congenital color blindness, and with disturbances of development in other parts of the body, malformations of the skull, congenital dislocation of the joints, defects of the upper jaw.

A case observed by Professor Hess in a rabbit is reported in detail, which seems to demonstrate the possibility of partial degeneration of the lens during fetal life, i. e., at the time of the development of the first lens fibers.

Ruhwandl calls attention to some other observations which may strengthen the views of the congenital nature of zonular cataract. In many lenses of individuals of various ages, opacities in form of dots or drops may, during life, be ascertained, especially with the corneal loupe of Zeiss, as incidental observations. Ruhwandl saw more than thirty cases within the last year in people who came to the clinic on account of external affections, and who showed a moderate number of dotted or flocculent opacities of the lens, arranged in anterior and posterior shells around the nucleus. Most of these patients with "rudimentary zonular cataract" had not passed the thirtieth year. Vision was mostly normal, in one of the uncomplicated cases below one-half or one-third. It was remarkable that in three instances these rudimentary zonular cataracts occurred in children of the same family. Rachitic changes of the teeth and the bones were relatively frequent, but the anamnesis as to convulsions was generally negative.

The literature is extensively utilized and quoted and the histological conditions are illustrated on lithographic plates. The interesting essay deserves a closer study. C. Z.

TECHNIC OF THE SIMPLE AND OF THE COMBINED OPERATION FOR THE EXTRACTION OF MATURE SENTE CATARACT.—FRIDENBERG, P., New York (*Am. Jour. of Ophth.*, June, 1907), describes in detail the steps of the two type operations. The form and position of the section, the various methods of capsulotomy, the expression of the lens, irrigation, and the toilet of the anterior chamber and incision, and the various forms of iridectomy are presented. The modifications of technic, complications and accidents during the successive steps are then considered. The article deals with these features at length and can not well be abstracted. P. H. F.

THE INCISION FOR THE EXTRACTION OF CATARACT.—WEEKS, J., New York (*Jour. Am. Med. Assn.*, June 22, 1907), reviews the history of ophthalmology from the time of Daviel, and gives a detailed description with diagrams of the various sections recommended and practiced by well-known operators. The incision preferred by Weeks is one in common use, which runs in the limbus, takes in two-fifths to one-half the corneal circumference, and terminates above in a conjunctival flap 2.5 mm. to 3 mm. high. The technic of the incision is described in detail and the various complications, errors and accidents considered.

P. H. F.

EXTRACTION OF THE LENS; IRIDECTOMY; TOILET OF THE WOUND.—FOX, L. WEBSTER, Philadelphia (*Jour. Am. Med. Assn.*, June 22, 1907), takes up the technic of cataract extraction at the point which follows completion of the section. The laceration of the capsule is an important one in which various complications may occur. The technic is not simple. The various cystitomes and capsule forceps used by ophthalmologists from the time of Daviel were shown and their application discussed. In toilet of the anterior chamber, Fox finds massage and the use of the spoon of great assistance.

P. H. F.

DOES THE OPACITY OF INCIPIENT CATARACT EVER REGAIN TRANSPARENCY?—CONNOR, L., Detroit (*Jour. Am. Med. Assn.*, July 6, 1907), has made graphic records of the striæ observed in beginning cataract, and has observed partial or complete clearing in seven cases. In a diabetic case, both lenses became transparent and remained so until the patient's death. This clearing up is rare, yet fifty-one observers report 147 cases. It is most frequent in the earlier stages of development. In the discussion of this paper, attention was called to the rôle of chorioiditis and of disturbances of general health in causing lenticular opacities. These cases were benefited by correction of ametropia, regulation of diet, and treatment of the chorioiditis. Improvement of vision might be due to gradual fading of incipient cataract, but was more often due to clearing of vitreous opacities. High arterial tension, with or without renal disease, gastrointestinal autointoxication, and uric acid diathesis seem to be important etiologic factors. Lenticular opacity changes due to imbibition of aqueous, as in traumatic cataract, is most easily absorbed, whereas changes due to shrinkage generally persist. Hess called attention to experimental naphthalin cataract in rabbits. Ingestion of this drug destroys the lens epithelium and thus allows fluid to enter and spread between the fibers, producing

opaque striae. If the drug be stopped the epithelium recovers and the opacities clear up. Similar conditions probably occur in man.

P. H. F.

LOSS OF VITREOUS HUMOR IN THE OPERATION FOR THE EXTRACTION OF CATARACT.—RAY, J. M., Louisville (*Jour. Am. Med. Assn.*, July 6, 1907), finds much diversity of opinion as to the effect and prognostic significance of this accident. In his experience, one of the most frequent causes is an improperly fitting or badly constructed speculum. Resort to a lid retractor immediately after removal of the lens would obviate it in many cases. Loss at the time of operation adds to the danger of primary infection, irrespective of the quantity lost, but depending on the care used in the preparation of the field, while the danger of iridocyclitis during the stage of healing is always greatly increased. Hyalitis with closure of the pupillary space is a frequent result of the cyclitic irritation. Floating opacities develop and may organize into bands which cause detachment in later years. In the discussion, attention was called to the factor of intractability of the patient, and stress was laid on the importance of a good speculum and the advantages of removing it at an early stage of the extraction operation. The use of saline solution to restore normal tone and shape of the globe after loss of large amounts of vitreous was advised. When the vitreous is fluid, loss seems to be less deleterious than otherwise, as the prolapsed portion does not separate the lips of the corneal section and there is no increased danger of infection of the wound. The remote effects are always worse than the immediate sequelæ. A small bead of vitreous may be snipped off with good results, but often there is repeated prolapse. This interferes with the replacement of the iris, the removal of cortical remnants and the toilet of the anterior chamber and wound, and in this way, by preventing a complete and tidy operation, does the most mischief. It may even prevent extraction of the lens, due to its sinking into the depths of the eye when there is sudden prolapse of vitreous early in the operation.

P. H. F.

PRELIMINARY IRIDECTOMY IN CATARACT EXTRACTIONS.—MAXSON, S., Utica (*Am. Jour. of Ophth.*, July, 1907), finds that this procedure gives one an excellent opportunity to study the patient, besides relieving the operator of the fear of iris prolapse, while the patient loses the fear of being hurt and comes to the final operation well drilled. The extra time is well spent, the safety greater, and the results excellent.

P. H. F.

THE RIPENING OPERATION FOR IMMATURE SENILE CATARACT.—TODD, F. C., Minneapolis (*Jour. Am. Med. Assn.*, March 9, 1907), has taken the consensus of opinion of 69 prominent ophthalmologists, and concludes that this procedure is indicated in case of immature cataract in which preliminary iridectomy is to be performed, and in those patients who would not be likely to behave well during the extraction, thus preventing the operator from performing much toilet or from practicing irrigation. If irrigation is not practiced, it is indicated in all patients under 60 with immature senile cataract, requiring speedy relief. It is contraindicated in high myopia, chorioiditis or other inflammatory conditions, tendency to glaucoma, and in the presence of iritic adhesions. It is not necessary where a cataract is nearly mature or the patient over 60, a translucent or amber-colored nucleus indicating that the cortex is not abundant and can be removed easily. P. H. F.

CATARACT EXTRACTION WITH MODIFIED IRIDOTOMY.—VERHOEFF, F. H., Boston (*Jour. Am. Med. Assn.*, March 16, 1907), makes the corneal incision in the usual manner. The iris is then grasped with forceps as near the root as possible and a small bit of tissue excised with scissors so as to leave a small "buttonhole." DeWecker's small iris scissors are then introduced and a clean cut made through the iris to the pupil. Atropin is instilled after operation to enlarge the coloboma and guard against iris prolapse. Cortical matter can be removed with even greater ease than after an iridectomy, while there is less pain and rough handling of the iris. Iris tissue is removed where it will most effectually prevent prolapse, and the optical and cosmetic effect is much better. Dazzling is notably absent. P. H. F.

IMMEDIATE AFTER-TREATMENT OF PATIENTS OPERATED ON FOR CATARACT.—WILDER, W. H., Chicago (*Jour. Am. Med. Assn.*, June 22, 1907), considers the various postoperative procedures, such as attention to the bowels, sedatives for the restless, the importance of absolute quiet and rest of the eye. Leakage, prolapse of iris, hemorrhage, infection, iridocyclitis, vitreous opacities, are also considered. The details must be consulted in the original paper, which is full of practical and instructive points. P. H. F.

THE USE OF THE SECONDARY CATARACT KNIFE.—BLACK, M., Denver (*Jour. Am. Med. Assn.*, March 16, 1907), has devised a probe-pointed cataract knife which can be introduced through the original puncture in case it has been necessary to withdraw the Graefe knife on account of restlessness of the patient, danger of

wounding the iris, loss of aqueous or similar accident. The section may be completed with sawing motions, no counter puncture having been made. If the iris falls in front of the knife, the chamber is allowed to refill, and the secondary knife is worked over the iris, pushing it back. The knife may also be used to enlarge the angles of a section which proves to be too small and in case the Graefe knife has been introduced wrong side up. P. H. F.

THE IMMEDIATE AFTER-TREATMENT OF CATARACT OPERATIONS.—SCALES, J. W., Pine Bluff, Ark. (*Jour. Am. Med. Assn.*, June 22, 1907), discusses the open treatment by means of the wire screen, the avoidance of infection and the objections to the use of the bandage. The sitting up of the patient has a number of advantages which are given at length. The avoidance of iritis and cyclitis by the use of atropin is also touched upon. P. H. F.

OPERATIONS FOR SECONDARY CATARACTS.—CALLAN, P., New York (*Jour. Am. Med. Assn.*, June 22, 1907), finds that thin gauze-like after-cataract generally, yields to a discission performed with the knife-needle. Tough resilient bands are best cut with a thin Graefe knife. Bowman's two-needle operation is condemned, as it causes too much traction on dense membranes. In these cases and many of thinner membrane, De Wecker's scissors are invaluable, as no traction need be caused. In all complicated forms of secondary cataract, occluded pupil, incarceration or prolapse of iris, it is the only instrument of which a proper use combines a minimum of risk with a maximum of benefit. P. H. F.

SOME IMPORTANT CONSIDERATIONS IN THE EXTRACTION OF CATARACT.—STEVENSON, M. D., Akron (*Jour. Am. Med. Assn.*, March 16, 1907), advises careful examination of general and local conditions before operation. If chronic inflammation of the conjunctiva be present, treatment should be used and the discharge cured. A test bandage may be applied and the discharge examined microscopically. Obliteration of the tear sac may be necessary. An eye bath is used three times daily for a week. The eye is closed with a sterile pad and the nose sprayed several times, an hour or so before operating. The bowels are emptied and kept locked by giving an enema. The hair, brows and lashes are carefully washed the night before. The skin of lids is cleansed mechanically and the lid margins expressed. The head is covered with a rubber bath-cap or sterile towel, and the breath directed away from the eyes by means of a light screen of adhesive covered with gauze and fastened across the bridge of the nose and both cheeks. The surgeon

should wear a cap and a gauze veil. Cocain and adrenalin are instilled and also injected at the site of puncture and counter-puncture. This raises up the conjunctiva, and a flap is formed extending 3 or 4 mm. beyond the corneal section throughout its entire extent. A sphincterectomy is performed before delivery of the lens. With a sharp cystitome two cuts are made in the capsule. The capsulotomy has the form of an inverted Y or Greek lambda. The flaps roll up out of the pupillary area, and there is no danger of incarceration of shreds of capsule in the section. After expression of the lens by gentle manipulation, the anterior chamber is irrigated. One-half per cent. eserine is instilled to cause slight contraction of the sphincter. Light dry pads are fastened over the eyes with adhesive plaster strips and a protective mask applied. Quiet of the patient for the first day or two is important. Coughing, vomiting, straining at stool must be carefully avoided. Morphine may be given by hypodermic an hour or so before and again after operation. The first night must be a comfortable one. P. H. F.

A HISTOLOGICAL STUDY OF THE NORMAL HEALING OF WOUNDS AFTER CATARACT EXTRACTION.—HENDERSON, T., Nottingham (*Ophthalmic Review*, May, 1907), made sections of 33 aphakic eyes in which healing was progressing normally. A vertical incision through the cornea is followed by a greater retraction of the anterior and posterior than of the central corneal layers, so that the wound-margins show two curved surfaces meeting at the middle. Irregularities of these surfaces, due to sawing motion in the section, may give the wound track a notched, wavy or step-like form. There is also a tendency for the corneal flap to override the peripheral scleral lip and cause further gaping. This is due to the extensive incision, allowing the corneal lamellæ to be released from their normal tension, and is more marked in an oblique cut. In a purely corneal incision, mediate union is first brought about by a fibrinous exudate from the corneal lamellæ or more probably from the aqueous, causing agglutination about the center of the incision. Later on the surface epithelium and posterior endothelium grow down and proliferate till they meet and cover the lips of the wound and the fibrinous plug. This generally takes two or three days, but may be much delayed in apparently uncomplicated cases by some individual factor in wound repair. When there is excessive gaping, corneal epithelium may make its way into the anterior chamber, and even block the iris-angle. The corneal elements play no part until more than two weeks after operation, when they grow, compressing the fibrinous plug, and finally coalesce completely, caus-

ing firm and permanent cicatrization two or more months later. In limbal or scleral incisions, the place of the corneal epithelium and endothelium is taken by episcleral connective tissue and vessels derived from the conjunctival flap. This does not take place until after the third day. Later these cells are replaced by scleral tissue cells. The resulting cicatrix is broader and more distinct than in corneal section. The relative inactivity of the sclera is due to its lack of vessels (?). This mode of healing also explains post-operative astigmatism, which is more marked in the peripheral flap operation than after linear incision, the intercalated tissue from the limbus acting as a wedge. The article is illustrated by a number of poorly executed drawings and some rather obscure photomicrographs.

P. H. F.

THE TECHNIC OF DISSECTION OF SECONDARY CATARACT.—LUBOWSKI, ERNST, Kattowitz (*Klin. Monatsblaetter fuer Augenhelilkunde*, xlv, Maerz, April, 1907, p. 366). For the last two years, Lubowski practiced the following method with excellent results: After atropinization and thorough cleansing, a peripheral corneal section, 2 to 3 mm. long, 1 mm. towards the nasal side from the lateral margin, is made with a small lance-shaped knife. Then a Stilling harpoon or cystitome is flatly introduced as far as the opposite pupillary margin, its point plunged into the cataract and slowly, without pressure, drawn in a horizontal direction through the cataractous membrane. At once a gap forms, if, which is of importance, the cut commenced at the thinnest portion of the secondary cataract. The next day the eye is without irritation. Oblique, or rather electric, illumination is preferable. Lubowski sees in the loss of aqueous a protection against infection. The method yielded equally good results in recent as in very old tough membranous secondary cataracts.

C. Z.

DEPRESSION OF THE POSTERIOR OCULAR POLE FOLLOWING CATARACT EXTRACTION.—FUCHS, E., Vienna (*La Clinica Oculistica*, May, 1907). Seven years ago the writer called attention to the fact that, following cataract extraction or excision of the iris, there could sometimes be noted a serous detachment of the chorioid, which was considered a great rarity. To see the detachment it was necessary to examine the eye with the ophthalmoscope the first few days following the operation. All eyes should be examined, the external appearance of which would lead to the supposition of a detached chorioid; that is to say, when the anterior chamber, already re-established, shows blood extravasation or the margins of the wound without any visible opening are swollen. The ophthalmo-

scopic examination shows detachment of the chorioid under the form of an obscure swelling with smooth surface situated at the periphery of the fundus. Small detachments at the periphery and slightly prominent are difficult to see; large detachments projecting into the vitreous can be seen by simply illuminating the pupil with the ophthalmoscope. Retinal vessels rise with a marked curvature from the posterior margin of the detachment. From the detached retina, the detached chorioid is distinguished by its smooth surface, its brown color and by the absence of fluctuation; while detached retina is most frequently localized below, detached chorioid is found usually on the temporal or nasal side and only exceptionally above or below. The detachment of the chorioid diminishes gradually in size after a few days and finally disappears, and at the same time the anterior chamber becomes deeper and the bulbus, which was soft during the attachment, acquires normal tension. The prognosis is, therefore, good. Detached chorioid is rarely seen because the operated eyes are not examined with the ophthalmoscope until the patient is well, by which time the detachment has disappeared. The probable manner of production of the detachment is as follows: During the operation it is easy to produce a small laceration of the ligamentum pectinatum which covers superficially the ciliary body corresponding to the anterior chamber and the root of the iris. The aqueous humor then filters into the space under the chorioid, traversing the laceration on the side of the anterior chamber and pushing the chorioid towards the vitreous.

R. H. J.

ON THE DISEASED CRYSTALLINE LENS.—MILE. TOFFESCO (*Annales d'Oculistique*, July, 1906), gives an historical summary of the pathological anatomy of cataract and adds some observations of her own upon the degenerative processes of the crystalline fibers.

She concludes that cataract always commences in the region of the equator; at least the degenerative processes immediately appreciable first appear there. That the degenerative processes appear to be the same in all forms of cataract (except, perhaps, in black cataract), congenital or acquired, but are observed in different stages of their evolution. That one of these fundamental degenerations appears to consist in fatty degeneration of the crystalline elements.

G. C. H.

ON A LITTLE KNOWN FORM OF COMPLICATED CATARACT.—PURTSCHER (*Archives d'Ophthalmologie*, April, 1907), reports several cases of cataract with the following characteristics: A thinned sclerotic of a bluish porcelain white; a deep anterior chamber; a

dull grayish-brown iris without the usual design of structure of a sharp differentiation of the large and small arterial circles, an ectropion of the uvea and a contracted and sluggish pupil; generally marked iridodonesis and fluid vitreous; a predisposition to glaucoma, cyclitis and detachment of the retina. The cataract seems to be the result of the abnormal structure of pathological changes of the eye. The patients were all about 30 years of age, and the lenses presented a whitish opacity, sometimes cortical and sometimes general. The author's experience with discission in these cases has been disastrous. The operation was usually followed by cyclitis, glaucoma or detachment of the retina. He thinks that preliminary iridectomy, followed by extraction with the wire loop, offers the best chance of success.

G. C. H.

CHORIOID.

CHORIORETINITIS THROUGH NAPHTHALIN IN MAN.—VAN DER HOEVE, J. (*Tydschr. v. geneesk.*, Aug. 11, 1906), examined a caporal, who complained of diminution of vision. On April 9, 1906, naphthalin dust came in his left eye, which was quite painful and produced a light conjunctivitis, which soon healed. On May 16 the pain returned in that eye and he noticed an important diminution of his sight. A slight conjunctivitis and changes in the chorioid were found; V. = 1/vi.

On May 26, V. D. Hoeve found V. O. D. = 5/v; V. O. S. = 5/xxx. The left eye showed, in the macular region, fresh foci of retinitis and some older ones, which began to be pigmented, and atrophic spots. A clear, white, glistening spot, giving the impression of a crystal, is seen to the temporal side of and beneath the papilla. Some more retinitis foci are scattered over the fundus. The temporal quadrant of the papilla is much whiter than the rest; the vessels are without changes. The field of vision is narrowed concentrically and shows an absolute scotoma somewhat below to the temporal side of the point of fixation. Urine normal. No other causes for the retinitis. Formerly the vision of that eye had been normal. Patient is unable to state the quantity of naphthalin which came in his eye; it was quite large and was not removed. He handled naphthalin during the last three years, even daily during the last two months.

E. E. B.

CILIARY BODY.

TWO CASES OF GUMMA OF THE CILIARY BODY.—MILLER, G. V.. Stockton-on-Tees (*Brit. Med. Jour.*, July 13, 1907), reports these interesting observations, both in adult males with definite specific

history. There was marked ciliary injection, followed by bulging, a large deposit of pus in the anterior chamber requiring evacuation, subsequent development of stippled opacities in the cornea, and marked reduction of vision, in both cases. Under mixed treatment, atropin and dionin, there was marked improvement, although it was noted that, after continued use, the last-named drug caused the formation of bullæ on the cornea.

P. H. F.

INFECTIVE CYCLITIS IN RELATION TO PENETRATING WOUNDS OF THE EYEBALL.—DUNN, P., London (*Brit. Med. Jour.*, July 27, 1907), discusses "sympathetic ophthalmia," a term which he considers inaccurate and absurd. There is always a history of injury, however slight, such as a mere tattooing of the cornea. The period of incubation is extremely variable. Involvement of the second eye may take place from ten days to many months or even years after the exciting cause, in this respect suggesting the course of traumatic tetanus, with its origin from punctured wounds and marked predilection for certain tissues. The open treatment is advised for all wounds in the ciliary region, and the author warns against suturing the conjunctiva, cornea or sclera, or interfering surgically with the wound even to the extent of removing a prolapse of any part of the ciliary body. It is only in this way that sympathetic ophthalmia can be prevented (? P. H. F.). Infective cyclitis, like tetanus, again has become less and less frequent and less virulent, owing to antiseptic treatment. A mild infection may merely cause infective irritation of the second eye. Section of the inflamed nerve in tetanus is paralleled by the prompt and beneficent effect of enucleation of the exciting eye. Ciliary wounds are not dangerous because of their position but only in case of infection, and a prolapse covered with conjunctiva is well protected. In all cases of infective eye, a section should be made through the wound scar, laying it open and exposing it to thorough antiseptic douching. In the presence of a ciliary wound, one should always consider the possibility of a foreign body in the globe, the degree of injury and chances for recovery of sight. Immediate enucleation is always inadvisable. In ciliary wounds, even those with prolapse or escape of vitreous, healing takes place without reaction if infection is averted by open antiseptic treatment.

P. H. F.

CIRCULATION.

EMBOLISM OF THE CILIORETINAL ARTERY.—KRAUSS, FREDERICK. Philadelphia (*Ophthalmic Record*, April, 1907). A girl of 18 years was seen with a blocked cilioretinal artery which arose from

the center of the optic nerve head near the temple border and passed up vertically for about one-half disc diameter, then made a sharp loop and ran out into the retina to the macular region. It sent out several branches and finally divided into two terminal branches. This whole region, with the exception of the lower part of the macula, was supplied by this artery. The lower part of the macula was supplied by the inferior temporal artery. The blind spot in the field corresponded to the portion supplied by the cilio-retinal artery. Gradual improvement in the appearance of the edematous retina and reduction in the size of the blind spot took place, resulting finally in complete restoration of function through collateral circulation.

M. B.

TREATMENT OF HEMORRHAGES IN THE RETINA.—WINLOMENT (*Klinisch-Therapeutische Wochenschrift*, May 13, 1907). Bleeding in the retina is very often a symptom of incipient arteriosclerosis; there are, however, bleedings in the retina due to other causes, such as congenital fragility of the blood vessels or dyscrasic affections.

Hemorrhages in young persons, as a rule, give a good prognosis, because the blood is easily and quickly resorbed.

The treatment consists of the administration of quinin, iron and sour drinks, such as lemonade; ergotin internally or by subcutaneous injections, fluid extract of *hydrastis canadensis*, *viburnum prunifolium* or *hamamelis virginica* in 20 or 30 drops three times a day, are useful, as are thyroid extract or 1:100 adrenalin solution 8 to 10 drops per day. Gelatin may be administered in the following way:

Gelatin pur. steril.....	2.0
Natr. chlorid	1.0
Aquæ destill	100.0

S.—For subconjunctival injection.

Other causes for hemorrhages in the retina are leukemia, progressive pernicious anemia, azoturia and phosphaturia. All serious infectious diseases which cause toxemia can lead to hemorrhages into the vitreous. Vasoconstrictor remedies are contraindicated in bleedings into the retina when that is due to arteriosclerosis.

J. G.

CONJUNCTIVA.

THE UNILATERAL FORM OF TARSO-PALPEBRAL VERNAL CONJUNCTIVITIS OCCURRING IN A YOUNG GIRL.—WOOD, CASEY A., Chicago (*Ophthalmic Record*, June, 1907). During the spring and summer in the last four years, this child of 11 years was ob-

served to have the symptoms of vernal conjunctivitis in her left eye. Last fall horny growths were observed on the left upper lid and there was a drooping of the lids. Some of these growths were subjected to microscopical examination by Dr. Thomas A. Dagg, pathologist to St. Luke's Hospital. He reported chronic hyperplasia of the epithelium and underlying connective tissue. He says the process is of an inflammatory nature, as indicated by the amount of round-cell infiltration. The diseased parts were exposed daily for six weeks to the x-rays. The patient was relieved of all her symptoms and the clinical appearances of the lids vastly improved.

M. B.

INVESTIGATION OF SOME UNUSUAL FORMS OF CONJUNCTIVITIS.—HUDSON, A., and PANTON, N., London (*Lancet*, July 6, 1907), find that both *Staphylococcus albus* and *aureus*, as well as streptococci, may cause acute conjunctivitis and give rise to a considerable percentage of all cases. The severity of the attack varies with the virulence of the germ, but is generally most marked with streptococci, least with the white staphylococcus. When present with other germs, these micro-organisms tend to increase the severity of the infection. Both forms are apt to cause formation of membranes. Conjunctivitis due to diphtheria bacilli is unusual and is difficult to diagnose clinically. Pseudo-diphtheria bacilli are often present in combination with other forms and seem to have no effect on the ocular inflammation. Not a single case of pneumococcus conjunctivitis was seen. It must be unusually rare in London. It is not easily differentiated from streptococcus, encapsulation alone being an insufficient feature for identification. (With the latest developments in staining methods, as those of Buerger, Aronson and others, there should be little difficulty in making a differential diagnosis between the streptococcus and the pneumococcus.—P. H. F.). Organisms of the *coli communis* group are rare as causes of acute conjunctivitis.

P. H. F.

CASE OF STREPTOCOCCIC CONJUNCTIVITIS.—CUNNINGHAM, H., Belfast (*Brit. Med. Jour.*, July 20, 1907), reports an almost pure infection of marked virulence, leading to perforating corneal ulcer in spite of treatment, in an infant 2 years old. In the early stages it resembled acute epidemic conjunctivitis. There was a semi-purulent eruption on the face, suggesting autoinoculation. The right eye was not affected during the whole course of the disease. The condition is extremely rare. The parotid and posterior cervical glands were enlarged. There were no signs of Parinaud's conjunctivitis which the adenopathy suggested. Ulthoff has described

a somewhat similar class of cases due to the streptococcus and complicated with impetigo of the face. The conjunctivitis is usually membranous. P. H. F.

PARINAUD'S CONJUNCTIVITIS: A REPORT OF TWO CASES.—KRAUSS, FREDERICK, Philadelphia (*Ann. of Ophthalmology*, January, 1907). Two cases of this disease as seen by the author are described in full—one a boy of 12 and the other a girl of 10. The symptoms were those usually present in this disease. The treatment consisted of washes of biborate of sodium and camphor water every three hours, 25 per cent. argyrol every four hours, 2 per cent. solution of silver nitrate applied to the everted lids, iced compresses, and for glandular swelling hot compresses of lead and opium were constantly applied, covered with thick layers of raw cotton and oiled silk. Both cases made good recoveries. M. B.

METASTATIC CONJUNCTIVITIS IN GONORRHEA.—CARROLL, J. J., Baltimore (*Jour. Am. Med. Assn.*, July 13, 1907), reviews the literature and reports two cases of this disease. Arthritis was conspicuous in the first case, the diagnosis in the second instance being based on the presence of gonorrheal urethritis, the type of bilateral conjunctivitis, the absence of gonococci in the conjunctival secretion, the iritis which appeared on the fifth day, and the slight but appreciable systemic disturbance. This affection usually starts out with an ordinary purulent gonorrheal urethritis. Conjunctivitis appears rather early, but at times during a second or third attack involves mainly the fornix and ocular conjunctiva of both eyes, is associated with mucopurulent secretion containing no gonococci, generally with arthritis, and shows a marked tendency to relapse. An increase in the urethral discharge is often a forerunner of the fresh attack of blennorrhea and joint affection. Metastatic arthritis or iritis, bilateral involvement, mild blennorrhea without much swelling of the lids and with profuse discharge or tendency to corneal complications, and the absence of gonococci in the conjunctival secretions are the characteristic features. All reported cases have occurred in men. Metastatic gonorrhea may affect the serous and mucous membranes throughout the body, notably those of the heart, pleura, lungs, pericardium, brain, veins, kidneys, and muscles, besides causing subcutaneous abscess, general septicemia, diseases of the peripheral and central nervous system, and lesions of the skin. In the eye we may have metastatic iritis, dacryoadenitis, tenonitis, keratitis, iridochorioiditis, retinitis, neuritis and panophthalmitis due to gonorrhea. The ocular affection may be due to bacilli transported in the blood current to a mixed

or secondary infection in which the gonococcus merely prepares the soil, and finally to toxins, discovered by Morax and Elmassian. Early bacteriologic examination of conjunctival secretion, blood and fluid from any involved joints in cases of metastatic conjunctivitis might shed light on this subject. In the discussion it was noted that repeated examinations of the conjunctival secretion may show gonococci which were not found at first, and that a marked conjunctivitis usually precedes or accompanies metastatic iritis. The latter is often characterized by spongy or gelatinous exudate in the anterior chamber, resembling a dislocated lens, or in the vitreous.

P. H. F.

EPITHELIAL INCLUSION CYSTS OF THE CONJUNCTIVA.—OATMAN, EDWARD L., Brooklyn (*Arch. Ophth.*, May, 1907, xxxvi. 353). The author describes epithelial lined cysts of the conjunctiva, appearing after the expression operation for trachoma, due to exclusion of epithelial cells from communication with the surface. He gives the clinical history and microscopic findings of such a cyst appearing on the lower conjunctival surface of the lower lid in a patient who had been previously operated on for trachoma. The author states that, in these cyst formations, the essential feature is "the segregation of some cells from the surface epithelium by inclusion in the substantia propria of the conjunctiva," and the ideal condition for giving rise to such cysts is the expression operation. He advises the breaking down of adhesions which follow trachoma expression. The article is illustrated.

W. R. M.

CORNEA.

CASES OF CONGENITAL INEQUALITY OF THE SIZE OF THE CORNEE IN NORMAL EYES.—HUBBELL, ALVIN A., Buffalo (*Ophthalmic Record*, June, 1907), claims that this condition is a rare one. He reports the only two cases in his experience. One was a girl of 18, the other a girl of 12. The older girl had normal vision and practically normal refraction in each eye. Her eyes were in every respect the same, with the exception that one cornea measured 10 mm. and the other 13 mm. in diameter. The younger girl had irides slightly different in color and the pupil of her right eye was smaller than its fellow. The right cornea measured $11\frac{1}{2}$ mm. and the left 13 mm. in diameter.

M. B.

RUPTURE OF DESCMET'S MEMBRANE DUE TO HIGH INTRAOCULAR PRESSURE.—ALT, A., St. Louis (*Am. Jour. of Ophth.*, May, 1907), reports fissures in this membrane of the eye of a child, aged 15 months, with an enormous keratectasia. There were two double

contoured gray lines in the back of the cornea almost concentric with the periphery. As tension was increased and a growth was seen through the hazy cornea in the depth of the vitreous, enucleation was performed. A good-sized glioma was found, which in one part reached forward to the lens. The ruptured ends of Descemet's membrane were found covered with endothelium, which had also grown over a new-formed lamina vitrea. Bowman's membrane was also wanting for some distance opposite the breaks.

P. H. F.

PYOCYANEUS ULCER OF THE CORNEA.—FRIDENBERG, P., New York (*N. Y. Med. Jour.*, June 1, 1907), reports a case of this unusual and virulent infection, in which the entire cornea sloughed in the course of a few days, in spite of the most vigorous treatment by actual cauterization (subconjunctival injections of bichlorid), and so on, from a very early stage. Bacteriologic investigation showed pure cultures of the bacillus of blue pus, and inoculation experiments confirmed this finding. There was no determinable injury. The eye became red after the patient had been out riding at a summer resort on the Jersey coast, where one would hardly expect to find the micro-organism mentioned. There was no green discoloration of the cornea and no conjunctival discharge. Anesthesia was a marked symptom. After the cornea degenerated, staphyloma developed and the eye had to be enucleated. P. H. F.

YEAST CELLS AS A PROBABLE CAUSE OF ULCERATIVE KERATITIS.—KEIPER, G. F., and BURRAGE, S., Lafayette (*Jour. Am. Med. Assn.*, July 20, 1907), report a case of corneal ulcer healing in ten days under atropin, hot applications and calomel powder locally. Bacteriologic examination revealed several pathogenic forms, *sarcina lutea*, a diplococcus, a bacillus and, finally, yeast cells. Inoculation of guinea-pig's eyes with the last named, either mixed or in pure culture, was invariably followed by corneal ulceration. The infection is probably analogous to that produced by *aspergillus* and other blasto- and hypho-mycetæ.

P. H. F.

TWO CASES OF KERATITIS DISCIFORMIS.—LANDMAN, OTTO, Toledo (*Arch. Ophth.*, May, 1907, xxxvi, 356). The author reviews the published literature of keratitis disciformis and details two cases which came under his observation. Both cases presented the same symptoms as described by Fuchs in his description of this disease. In the first case there was an entire absence of irritation: in the second case there was marked ciliary injection, pain, photophobia and neuralgia. There was no epithelial lesion in either

case, and both presented a central dense zone, outside of this a less dense zone, and then a saturated border limiting it from the surrounding cornea, which was clear. The author believes that the disease is one of inflammatory infiltration. W. R. M.

IMPORTANCE OF TRAUMATISM IN INTERSTITIAL KERATITIS.—DR. ENRIQUE B. DEMARIA, Buenos Ayres (*Anales de Oftalmologia*, Mexico, May, 1907). He describes two cases of typical interstitial keratitis following upon traumatism; in the first case in an individual plainly and certainly syphilitic by inheritance and who, though neither a child nor a youth, is young and within the required and common age, the disease developed in a few days after having received a fragment of stone on the left eye; in the second case, the author declares, there is nothing to authorize him to consider him as syphilitic or an hereditary syphilitic. In both, the affection was bilateral, beginning in the eye which had received traumatism, and in both cases keratitis appeared in the other eye after a few months.

After a long analysis of other observations of keratitis developed after traumatism, the author concludes: Relying on these elements and authentic observations, I can affirm that traumatism, in a predisposed subject, determines the appearance of interstitial keratitis. J. DE J. G.

AFFECTIONS OF THE EPITHELIUM OF THE CORNEA.—FRANKE (*Wiener Medizinische Wochenschrift*, May 11, 1907). It is a well-known fact that there are some cases of corneal erosions, which, after having been healed up, will at some future period become painful, and examination will show that this part of the cornea has been denuded of its epithelium. In these cases, it is very often possible to remove the epithelium from the greatest part of the cornea, so that only a small border of the cornea remains covered with epithelium.

Even in cases where, with a magnifying glass, no changes are to be observed on the corneal surface, but where the patient has had the characteristic symptoms and history of injury to the cornea, removal of the epithelium is possible. This easy removal of the corneal epithelium, "disjunction of the epithelium," can be accomplished after scratching the cornea or injuring it with a foreign body; it may also be accomplished in cases of keratitis disciformis, and dendrica, in *ulcus serpens* and in *herpes* of the cornea.

Microscopically, the epithelium shows characteristic changes of degeneration. The author is of the opinion that injuries produce the chemical or bacterial changes in the epithelium. However, it

has not as yet been explained why an erosion will sometimes heal up without and at other times with sequelæ. J. G.

TUBERCULOSIS OF THE CORNEA AND IRIS.—VERWEY, A. (Doctorate thesis), wished to find out experimentally if bringing in of air in the anterior chamber influences beneficially tuberculous affections of the eye, and why. Our knowledge of ocular tuberculosis has enlarged much since Leber spoke of the mitigated form (1891). As to the way of infection, Verwey thinks that hematogenous infection happens frequently, but that ectogenous infection can not be excluded; especially the similarity of the experimentally made cornea and iris tuberculosis, with the clinical observations, strengthen this last statement. Beginning ocular tuberculosis is frequently mentioned lately, probably because these conditions will be observed much more readily in the eye than elsewhere. The most important diagnostic symptom for tuberculous iritis are the localization in the middle or the ciliary parts of the iris, often in the inferior part, usually of a grayish-yellow color and making little pain.

Verwey now gives the histories of fourteen cases from Professor Koster's clinic. They all last long and relapse often. The disease is seen mostly in youth, and the tension of the affected eye is as good as always diminished. Two patients died, one from brain tuberculosis, the other from lung tuberculosis; they were very tuberculous persons. These ocular affections seem not to endanger life very much. Six times the disease affected both eyes, five times one eye and three times the other eye showed suspicious symptoms. Heredity is mentioned in six cases. Tuberculous affections in other places were found nine times; the examination proved negative in three cases. Only one patient had chorioiditis disseminata without showing the picture of a tuberculous chorioiditis; the changes of two other patients were insignificant, while one developed a choked disc through metastasis in the brain. Bacilli could be proved through experiments on animals with tumor tissue; three times this examination was negative. A pure culture grew from the suspicious material, which showed microscopically to be tuberculous from one patient; bacilli were found here in the aqueous humor with the second insufflation of air. With another patient they were looked for in vain. The aqueous humor of two patients was inoculated on glycerin-agar without result, and inoculation of a rabbit's eye with this humor of the second patient was also resultless. The diagnosis was made pathologico-anatomically in one patient. Just these two mentioned cases, where bacilli were looked for in vain,

show that this does not have to weaken the diagnosis; for both the tuberculous nature of the disease was proved and still cultures with the aqueous humor did not germinate and did not make the rabbit's eye tuberculous. Seven patients showed a tumor of the iris with grayish disseminations in the surroundings. Four patients showed yellow discolorations in the irido-corneal angle and grayish infiltrations in the cornea with the peculiar aspect. Nearly all cases of the iris were on its under side and left the pupillar margin free, at least in the beginning. The therapy can not be called uniform. Radium and inunctions were as good as without success; atropin and iodoform salve did neither show much benefit. The consequent treatment with tuberculin was done with eight patients; insufflations with air with ten patients; these were repeated with intermissions of four to seven days. Sometimes the air was still present after two days, sometimes had disappeared after some ten hours. One case is remarkable, as the vision rose in one eye during treatment, while it diminished in the other. Decidedly benefited were two cases; vision remained stationary in four cases. The irritation of the eye disappeared always some time after treatment, with the exception of one case where the tumor grew and one case where the process came to a stand only after perforation. It is said that this treatment is without success with affections of the ciliary body; one case showed cyclitic precipitations and the treatment proved beneficial without doubt, but these precipitations also can come when the ciliary body suffers only from a reactive inflammation. It seems, therefore, that the air therapy had a beneficial effect not as much by ameliorating the vision as by bringing to a stand a progredient process. The large changes in the disease picture made it impossible to get a decided opinion.

With eight patients tuberculin was used always without the least harm to the general constitution; if coughing was present it rather diminished. The reaction of the temperature changed very much, which Verwey can not explain; it is not to be found in the specimen used. Four patients had reaction in the eye; the four others had no reaction, although one showed bacilli; all had more or less swelling of the arms at the place of the injection. Vision improved in six cases, one showed amelioration, only one case was very obstinate.

For deciding the value of the air insufflations it is necessary to produce experimentally tuberculosis of the anterior part of the eye in animals, which is very difficult, but which Verwey succeeded to produce in rabbits. He elucidates clearly the different points

which we have to look at in these experiments. The serious ocular tuberculosis killed the animals pretty quick; the more benign forms showed, even when left alone, a decided tendency for healing. Some animals lived for months and months with completely destroyed eyes. No great danger for miliary tuberculosis or propagation to the meninges does seem to exist. On postmortem the lung alone was often found to be infected. The experimentally ectogenous tuberculosis looks in many respects similar to the human ocular tuberculosis. In a fourth series Verwey produced really mitigated iris tuberculosis, the first symptoms appearing after 22 days; some animals lived for more than half a year; air insufflation and paracentesis had little effect, but it would be premature to draw conclusions from these few experiments.

ANTEPARTUM OPHTHALMIA: THREE CASES.—ROBINSON, G. DRUMMOND, London (*Ophthalmoscope*, June, 1907). During the last few years the author has seen three cases of antepartum ophthalmia at the British Lying-in Hospital, London. The cases were similar, since the mothers were primipara and about 20 years of age, and all were first seen during the second stage of labor. Each had a yellow vaginal discharge. The babies, when born, had red, swollen eyelids. Two per cent. silver nitrate was instilled at once, but, despite its use, within twenty-four hours the lids were enormously swollen and the purulent discharge was present. M. B.

ANTEPARTUM OPHTHALMIA.—FORD, ROSA, London (*Ophthalmoscope*, May, 1907). In both these cases of ophthalmia inflammation was present at birth. In each case labor was comparatively short—7 hours and 10¼ hours, respectively—so that infection must have reached the eyes before labor began. In each case, also, the inflammation was in an early stage, so that infection must have occurred within the last week of pregnancy. Since the membranes ruptured, ten minutes and one hour, respectively, before delivery, the micro-organism had apparently penetrated the unbroken membranes. These cases, then, are exactly parallel to that published by the author in *The Ophthalmoscope*, October, 1906, page 557, when it was suggested that infection before, but still very near, the onset of labor, might be explained by the physiological expansion of the cervix, which often takes place a few days before labor. M. B.

PURULENT OPHTHALMIA.—LUKENS, CHARLES, Toledo (*Ohio State Medical Journal*, May 15, 1907), first calls attention to the fact that, in a certain per cent. of purulent ophthalmias in infancy, the specific diplococcus of Neisser can not be demonstrated. He

says that the corneal lymph circulation of the child, being more active than in the adult, is undoubtedly one of the reasons for the better prognosis in the infant. The typical clinical picture and course of ophthalmia in the infant are described, and the importance of avoidance of abrasion of the cornea insisted upon.

The writer says there is no substitute for silver nitrate. He applies to the everted lids by means of a match stick with a piece of cotton wound about the end a solution of 5 or 10 grains to the ounce, depending on the severity of the case, followed immediately by a dropperful of boric acid or normal salt solution. Iced applications in the severe cases for one or two hours after the silver are usually quite beneficial. In the acute stage, intermittent iced applications are usually quite helpful, particularly if there be much swelling. The cleansing wash, normal salt or boric acid solution, should be used hourly or oftener, and the silver solution every twenty-four hours, the strength reduced as the case progresses. Dr. Lukens uses for a continuous antiseptic treatment a one or two grain solution of silver or argyrol in 25 to 50 per cent. solutions. A drop is placed in the eye after cleansing and left one to three hours, depending upon the length of time it checks pus formation. With such treatment the average length of time for treating purulent ophthalmia cases has been sixteen days. In cases of several weeks' duration, where the conjunctiva has become hypertrophied, a villous and rugous condition and a thin purulent secretion keeps up which silver nitrate will not control, a copper or zinc sulphate solution once or twice daily, in addition to the cleansing wash, usually acts well. The method of Credé is commended, and the results of its use in several institutions given. Bandaging the second eye as recommended by some is hazardous for infants, as the infection may get a good start beneath the bandage before the physician is aware of it.

M. D. S.

GENERAL DISEASES AND VISUAL ORGANS.

THE EYE: FROM THE GENERAL MEDICAL POINT OF VIEW. HOWARD, C. NORMAN (*American Medicine*, May, 1907), traces the connection between diseases of the eye and a large number of affections of other organs. He calls attention to endarteritis causing floating opacities in the vitreous and hemorrhagic retinitis, and gives the eye symptoms in other circulatory disturbances. He says that in diseases of the digestive system constipation has been held responsible for some of the cases of recurring styes; portal congestion for opacities in the vitreous.

The writer gives considerable attention to syphilis as a causative

agent in eye pathology, mentioning the paralytic effect that gumma of the brain may have upon the muscles by pressure on their paths of innervation embodied in the third, fourth and sixth cranial nerves. After referring to the diagnostic signs in the eye in nervous and mental diseases, the author concludes with an analysis of the results of the visual examination of a number of cases, and from his own observations and those of others states several conclusions as to the systemic effects of eye-strain. M. D. S.

OPHTHALMIC SYMPTOMS IN GENERAL DIAGNOSIS AND PROGNOSIS.—GUNN, M., London (*Brit. Med. Jour.*, June 8, 1907), refers to unilateral descending optic nerve atrophy as an early sign of disseminated sclerosis. The pupil reacts fairly well to light, but dilates under continued illumination. This reaction is a point in the differential diagnosis as against hysterical amblyopia, which is often suggested by the other functional symptoms. Central color scotoma is generally an early symptom, but disc changes may not come on until later. Homonymous hemianopia in elderly people is often due to vascular disease and may be a valuable symptom of general arteriosclerosis. Paralysis of ocular muscles, usually temporary, is not uncommon in early stages of locomotor ataxia. Sixth nerve palsy in a youthful patient should make us think of diphtheria. Double ptosis is seen in myasthenia gravis. Oscillation of the pupil is marked in epileptics. Marked inequality is often due to implication of one cervical sympathetic, such as may be produced by the pressure of a deep enlarged gland, a tumor of the esophagus or an aneurism of the carotid. In irritative lesions, the pupil is enlarged, but in paralysis it is contracted and can not be dilated with cocain. (Meltzer-Auer has shown that after extirpation of the ganglion, adrenalin will dilate a pupil which, on account of the paralysis of dilator fibers and loss of tonus, does not respond to cocain.—P. H. F.). Cycloplegia may follow attacks of diphtheria in which the throat lesions were slight. Grayish-pink nodules of exudate near the pupillary edge of the iris are suggestive of specific iritis. The clinical significance of chorioidal tubercle and of neuritis and choked disc are also considered, and attention called to the prognostic import of albuminuric retinitis and of vascular changes in arterial disease. P. H. F.

OCULAR NEURASTHENIA.—WOODS, H., Baltimore (*Jour. Am. Med. Assn.*, July 20, 1907), discusses eye-strain from the point of view of a general nervous debility. Successful treatment must take into consideration the mental and spiritual state of the patient, remote conditions such as latent or incipient syphilis, gastrointes-

tinal intoxication, chronic appendicitis, menstrual anomalies, the social and industrial environment. The symptoms suggesting a search for such remote lesions are absence of ocular explanation for the persistence of symptoms, "hysterical accommodation" (under which fanciful term the author describes our old friend, spasm of accommodation with recession of the near point, P. H. F.), and varying refractive states. In the discussion, stress was laid on defective nervous resistance as a factor in aiding minimal degrees of ametropia and muscular imbalance to induce severe eye-strain, the importance of most painstaking and accurate correction of refractive error in these neurotic patients, and the possibility of somatic or psychic disease being a cause of trouble where at first only ocular abnormality was suspected. We have been looking too much for the effect the eye has on the body and have overlooked the effect the body has on the eye. Anemia, poor nutrition, prolonged lactation, overwork, worry, must be considered. Nervous patients may be made neurasthenic by having their attention constantly directed toward their eyes.

P. H. F.

OCULAR SYMPTOMS IN CEREBROSPINAL MENINGITIS.—BALLANTYNE, A., Glasgow (*Brit. Med. Jour.*, July 27, 1907), studied a series of 73 cases. Eye symptoms were frequently present and suggest the importance of ocular examination. The most striking feature is the great variation in the symptoms—squint, retraction of the lids, sizes and reactions of the pupils, vision, etc.—in the same patient from day to day or even in the course of a single examination. Conjunctival hemorrhages and herpes of the lid are rather frequent in the onset, as is simple conjunctivitis, careful cultures of which may show the meningococcus. The uveal tract is not involved. Compared with tuberculous meningitis, we note the infrequency of paralytic squint and of optic neuritis, the frequency of spasmodic squint and dissociated movements. As to prognosis, retraction of the lids, corneal complications, absence of the pupil reflexes, true nystagmus, lid winking combined with jerky movements of the eyes, and optic neuritis are of grave significance, but the absence of ocular symptoms does not justify a favorable prognosis.

P. H. F.

PATHOGNOMONIC EYE SYMPTOMS IN RABIES.—COAKLEY, W. B., New York (*Med. Record*, July 6, 1907), has noted, as a terminal symptom of hydrophobia, pin-point contraction of the pupil resisting the local and hypodermic use of atropin and changing to medium dilatation immediately before death. Alcohol, opium, morphin, codein, carbolic acid, eserine and chloral, all of which contract

the human pupil, were given to normal dogs in lethal doses without producing the myosis noted in rabbits. A contracted pupil which yields to mydriatics is sufficient to exclude hydrophobia. The cornea and conjunctiva were found analgesic in almost all the cases, and choked disc was a frequent occurrence. P. H. F.

DYSMENORRHEA AND IRIDO-KERATITIS; THE THEORY OF THE KIDNEY EYE OF GAYET.—BOUCHARD (*La Clinique Ophthalmologique*, July 10, 1907). The author refers to the recent work on "the ocular troubles of genital origin in women" by E. Berger and R. Loevy, which, while appearing to be complete, nevertheless makes only brief reference to those cases which are the object of Bouchard's paper; while the cases are somewhat infrequent, Bouchard has seen three or four in the last six months, and he was able to observe them until a cure was obtained.

The clinical picture of these four cases presents a number of points of resemblance; they appeared in young women from 19 to 26 years old, well to do, with no need of active life, well nourished, menstrual troubles of more or less long duration which were always accentuated before the appearance of the ocular symptoms. After the initial symptoms, which included congestion of the optic papilla and retrobulbar neuritis, the affection, which was more or less painful, fixed itself upon the anterior segment of the eye, the iris and cornea. The cornea was in two of the four cases the site of infiltration, followed by phlyctenulæ. The loup of Berger, with the aid of strong oblique illumination, demonstrated fine, irregular, anastomosing arborizations which were not parallel, but which surrounded small islands of isolated spots, which latter appeared and disappeared rapidly and were modified from day to day. These corneal changes were not situated on Descemet's membrane, but were in the cornea proper superficially placed.

During the evolution of the disease there were fluctuations in the systemic conditions; the stomach, the appetite and the emaciation attracted attention, and the nervous system was also to be considered. With the re-establishment of the general health and ovarian function, the cases progress to cure.

The infiltration, more or less considerable, which in two cases preceded the actual malady (with slight consecutive myopia) was not increased by the interstitial keratitis; there were no hereditary specific stigmata, but arthritic troubles more or less intense. In one case the myopia apparently increased before the appearance of the iridokeratitis without the chorioid or the vitreous presenting any new lesions. The old infiltration during the period of intensity of

the disease was swollen; the thickness of the cornea was increased; the old infiltrated opacities elevated the epithelium; the cornea was embossed by small depressions, similar to those which occur when dionin had been applied.

Absence of vitreous lesions and the nearly complete absence of synechiae (same in a case which had not been recognized at first and which was treated with sulphate of zinc and antiseptic lotions) made Bouchard hesitate applying the name uveitis to this affection. The iritis was not plastic.

Notwithstanding periods of aggravation and of oscillations in the general health, the prognosis is always favorable, the resulting vision being normal. The duration of the disease varies from three to sixteen months.

Demets refers to Gayet's theory in regard to the etiology of certain general systemic malconditions and their bearings on certain eye diseases. He also mentions the recent and as yet unfinished work of d'Uribe Troncoso on the pathology of the ocular fluids in general troubles of the circulation.

Demets gives a résumé of the four cases he mentions at the beginning of his paper.

B. E. F.

IS EYE-STRAIN EVER AN ETIOLOGIC FACTOR IN EPILEPSY?—REIK, Baltimore (*Jour. Am. Med. Assn.*, May 4, 1907), reports four cases in which the active causative agent appears to have been eye-strain and in which correction of refraction error relieved the greater affection. Granting an hereditary disposition or direct transmission of alcoholism or insanity, the exciting causes with the possible exception of toxemia and trauma must act reflexly. Dentition, gastrointestinal and menstrual disturbances, emotional shock are no more potent than eye-strain. The removal of one excitant does not necessarily cure the disease, and, even if the eyes are kept in good condition, some one of these factors may precipitate a convulsion. Standish, Reber, Theobald, Crouch and others have reported cases of epilepsy cured by relief of eye-strain and every case deserves careful examination of refraction and muscle balance.

P. H. F.

AMAUROTIC FAMILY IDIOCY; CLINICAL AND HISTOLOGICAL REPORT.—COHEN, M., and DIXON, GEORGE S., New York (*Jour. Am. Med. Assn.*, May 25, 1907), report a typical case of this affection in which the eyes were enucleated less than three hours after death. The only changes detected were swelling of the multipolar ganglion cells, displacement of their nuclei, retraction of the cell reticulum, occasional disappearance of ganglion cells, and the general disap-

pearance of Nissl's granules; the appearance of dark granules by Weigert's stain in all the ganglion cells, the peculiar formation of the macula and fovea (there were six layers of multipolar cells at the macula on the temporal side and eleven on the disc side, doubtless due to a fold in the macula), the so-called "spacing out" of the external reticular layer near the macula, and beginning simple atrophy of the optic nerve. Zenker's fluid is the best solution for fixing the retina; formalin the worst. Some at least of the finer cytological changes may have occurred soon after circulation ceased. The arrested development theory of Sachs, the degeneration theory of Kingdom and Russell and the toxin theory of Hirsch fit together very well. If the central nervous system fails to develop properly the finer degenerations must follow, and it is only a step further to the development of toxins due to errors of metabolism.

P. H. F.

THE OCULAR COMPLICATIONS OF MUMPS.—WOODWARD, J. H., New York City (*Ann. of Ophthalmology*, January, 1907). This review discloses the fact that mumps is not the benign malady it is so often assumed to be. The range of its ocular complications extends from abscess of the eyelids to retrobulbar optic neuritis. These morbid processes may terminate in complete resolution and perfect restoration of function, or they may end in atrophy of the optic nerve and blindness of both eyes. The period in the course of mumps during which ocular complications most frequently supervene is when the usually observed symptoms of the disease have begun to subside, or within a few weeks after they have subsided. Abscess of the eyelids and dacryoadenitis, however, have, in a few instances, preceded by a number of hours or days, the well-known signs of mumps. No perfectly satisfactory explanation of the mode of production of the ocular complications has been propounded. The toxin theory seems to be the most logical. Treatment of such complications seems to have a very moderate influence on the course of the malady. The general tendency is toward recovery. M. B.

THE OCULAR SYMPTOMS IN A CASE OF TUMOR OF THE PITUITARY BODY.—HANSELL, HOWARD F., Philadelphia (*Ann. of Ophthalmology*, January, 1907). After taking up the history of this disease, the author reports the case of a man, aged 53, who complained of a veil over left eye that had existed for some time and of inability to read. No pain, no photopsia, pupils equal in size and reaction. So drowsy that he sleeps 22 out of the 24 hours. Lens of O. S. opaque in cortex, nerve pale, vessels small, no preceding neuritis. White field limited concentrically; small negative central scotoma. No

color perception. $V. = 1 \times$. In O. D. the nerve was pale, field concentrically contracted for form and colors, but all changes less marked than in O. S., the $V. = \frac{1}{2}$. Momentary diplopia in extreme right field. Pain developed in eyeballs. Visual power and fields continued to grow worse, and during last 18 months of his life he had spells of total blindness lasting about six weeks each. He was subject to violent attacks of temper. At postmortem a dark tumor was found occupying the pituitary body and measured 4 cm. horizontally, 1 cm. anteroposterially. No sign of inflammation of the adjoining tissues could be found. The optic chiasm and tracts were compressed and atrophic. The nature of the tumor is not definitely known, for the microscopical report was lost.

M. B.

EYE DISEASES IN CAISSON WORKERS.—PICK, D., Koenigsberg i. Pr. (*Centrbl. fuer Augenheilkunde*, Juni, 1907, p. 169). Heller collected 1,000 cases of diseases in divers and caisson workers, of which only a few had eye affections: transient ocular palsies (paresis of abducens), 1 ptosis with weakened accommodation, 1 hemianopsia and 2 transient amauroses. Ophthalmoscopic changes even in the most severe and fatal cases of caisson disease have not been mentioned.

Pick reports the following case: A man, aged 27, who had worked 8 hours and 17 minutes under water, felt, 10 minutes after emerging, weakness in his limbs, so that towards evening he could not walk. On the fifth day, deliria, high fever, Cheyne-Stokes breathing, ecchymoses at the thorax; pupillary reaction normal. bilateral optic neuritis and retinal hemorrhages. The whole macular region and surroundings were edematous, the fovea being marked as a dark red spot. R. 12, L. 6, whitish retinitic foci, opaque, homogeneous, ill defined, of about two to four times the width of a blood vessel. After four weeks the fundus was normal in both and $V. = 1$.

Etiologically two kinds of affections are distinguished in caisson disease, viz.: by compression and decompression. Postmortem and experiments have shown that the latter are due to the liberation of gas, especially nitrogen, from the blood. In very acute cases, air embolism of the heart and rapid death; in others, gas embolism with subsequent necrosis may occur. The gas may circulate in the blood for about six days.

In this case the changes of the optic nerve and the retina were ascribed to gas embolisms of the retinae. The proof was that the retinal foci were, without exception, located at the transition of the

capillaries to the fine veins, indicating the district which had become necrotic by gas embolism of the finest arteries, or first capillaries.

C. Z.

DOUBLE CHOKED DISCS ASSOCIATED WITH COMPRESSED-AIR DISEASE (CAISSON DISEASE).—CALLAN, LEWIS WHITE, New York (*Arch. Ophth.*, July, 1907, xxxvi, 509), reports a case of double choked discs occurring in a laborer employed in the East River tunnel. After working for two months, the patient began to have mild attacks of pains in the arms and legs; these continued for two months and then became so severe he could not stand. At that time his sight began to fail and he had diplopia. On admission to the hospital, eye examination showed a slight convergent strabismus of the left eye, not constant. Pupils reacted sluggishly to light and accommodation. Examination of fundi showed choked discs with small hemorrhages on the nerves and in the region of the macula. Vision: O. D., 20/c; O. S., 20/cc. Fields contracted. Treatment was as follows: Rest, K. I., Hg. inunctions. Condition improved, and three months later vision, O. D. 20/xxx, O. S. 20/lx.

W. R. M.

ON THE RELATIONS BETWEEN LESIONS OF THE CERVICAL SEGMENT OF THE SPINAL CORD AND REFLEX IRIDOPLEGIA.—BREMKE, D. (From the psychiatric clinic at Freiburg i. B. *Klin. Monatsblätter fuer Augenheilkunde*, xlv, Maerz, April, 1907, p. 257). From a very interesting critical review of the experimental, anatomo-pathologic and clinical investigations on the relation of reflex iridoplegia to lesions of the cervical segment of the spinal cord, from literature and his own observations of 37 cases of progressive paresis (controlled by histological examinations), Bremke reached the following conclusions:

1. The theoretical assumptions of Rieger and von Forster that the anatomo-pathological conditions of reflex iridoplegia were in all probability localized in the spinal cord almost all proved to be fallacious. The discovery of Graupp and Wolff is correct, that isolated iridoplegia upon light in the mere spastic forms of paresis is rare and perhaps exceptional. It is possibly a specifically tabetic symptom. This, however, can not be utilized for an etiologic connection between sclerosis of the posterior fascicles and Robertson's pupil, because tabes is not a mere spinal disease, there being no reason to consider the tabetic affections of parts of the brain, e. g., atrophy of the optic nerve, as dependent upon the spinal lesions.

2. The actual results of the experiments of L. Bach and others, as far as applicable to human pathology, speak against the depend-

ence of reflex inactivity of the pupil to light upon changes of the cervical portion of the spinal cord. The total separation of the spinal cord from the brain in these experiments left the pupillary movements uninfluenced.

3. The opinion of Reichardt, that Robertson's symptom is due to disease of the intermediate zone of Bechterew between the second and sixth cervical segments, has not been sufficiently founded by Robertson's findings and has been positively refuted by the controlling investigations of Kinischi Naka and the author and a case of Cassirer and Strauss.

4. All cases from older and recent literature in which reflex iridoplegia was attributed to lesions of the cervical portion of the spinal cord can not be upheld by exact criticism. The view of Linstow and von Monakow, that (tabetic) iridoplegia be due to disturbances of the reflex arc between primary optical centers and nucleus of the third nerve, is not yet repudiated.

Attention is called to the very frequent foci in the pulvinar of paretics (Raecke), and the opinion of Alzheimer that an affection of the central gray of the ventricles may be the cause of reflex immobility. The possibility must not be disregarded that there is no uniform cause of Robertson's symptom. However, one cause, quantitatively slight and very limited in space, is more probable. Its discovery may be expected from anatomo-pathologic investigations in man and systematic employment of finer methods, especially in recent cases. An extensive bibliography is appended. C. Z.

A NEW SYMPTOM OF BASEDOW'S DISEASE.—GIFFORD (*Wiener Medizinische Wochenschrift*, May 11, 1907). The writer found that in three patients suffering with Basedow's disease he had some difficulty in everting the upper lid, and after the eversion had been successfully performed it was very difficult to keep the lid in that position. This is one of the earliest symptoms of the disease, and is probably produced by an unusual irritability of Muller's muscle; this symptom might have some connection with Dolrymple's (Stellwag's) symptom. Another early sign is the thickening of the tissues beneath the eyebrows; the skin appears solid and thick: the lids seem to be swollen. J. G.

HYSTERIA OR MALINGERING IN A GIRL OF TEN YEARS.—TOFFANY, F. B., Kansas City (*Jour. Am. Med. Assn.*, March 16, 1906). reports the case of a child with good eyes and seemingly good vision who complained of seeing all objects as red except red ones, which appeared white. With a plane glass before the eyes and the suggestion that this lens would cure the defect, she immediately saw

things in their natural color. The condition disappeared as suddenly as it came, possibly in consequence of an operation (tenotomy for an existing slight strabismus) having been discussed in the child's presence. It is not likely that this was hysteria in the case of a child of 10, with no evidence of any immediate approach of the catamenia. There was no apparent cause for the malingering, as the child was modest, obedient, rather retiring and of excellent family.

P. H. F.

SOME UNUSUAL MANIFESTATIONS OF GONORRHEA.—POSEY, WILLIAM CAMPBELL, Philadelphia (*Ann. of Ophthalmology*, January, 1907). A case is reported of urethral gonorrhea in a healthy young adult; general infection as indicated by articular rheumatism; involvement of sphenoidal cells with gonococci in the discharge; a week later, gonorrheal conjunctivitis of both eyes, apparently from continuity of tissue in the sinus cells. Disappearance of ocular and nasal symptoms under treatment, but after a short period reappearance of both conditions, with the added element of a typical superficial punctate keratitis in both eyes. Cure after a month of active inflammation. Three months of absence of ocular signs, followed by a double iritis, with a fresh outbreak of rheumatism while taking baths for rheumatism. Disappearance of symptoms for two weeks after a month of treatment, followed by intense iridocyclitis in the left eye. His other case was in a young adult with urethritis which was soon complicated by pain and swelling of the larger joints. Both eyes suddenly became inflamed, the lids were red and swollen and there was a mucopurulent discharge. The cornea was at first clear, but after a few days became studded with subepithelial semiopaque areas. No gonococci were found in the ocular secretions.

M. B.

OCULAR MANIFESTATIONS IN VENEREAL DISEASES.—BRAY, AARON, Philadelphia (*Therapeutic Gazette*, May, 1907). This article is a general review of the diseases of the eye which are accepted as due to venereal disease. The author does not advance anything new.

M. B.

OCULAR DISTURBANCES DUE TO PRESSURE UPON OR STRETCHING OF THE CERVICODORSAL SYMPATHETIC.—DUNN, JOHN, Richmond, Va. (*Arch. Opth.*, May, 1907, xxxvi, 361). The author mentions three cases in which the eye symptoms were secondary to spinal disease and to which he has applied the term "The Spinal Eye." In all cases there was a peculiar bowing of the iris, giving the appearance of a bulging lens, a contracted pupil and lessening of

the depth of the anterior chamber. The symptoms were bilateral, and there was almost constant discomfort. There was spinal disease present in all cases, correction of which relieved the eye symptom. Dunn thinks there was either "a partial paralysis of, or chronic irritation from stretching or pressure upon, the oculo-spinal sympathetic." W. R. M.

ON CHANGES OF THE VISUAL ORGAN IN DEFORMITIES OF THE SKULL AND THEIR CAUSES, ESPECIALLY IN SCAPHOCEPHALUS (TURMSCHADEL) AND RACHITIS.—KRAUSS, W. (From the eye clinic in the Univ. of Marburg. *Ztschr. fuer Augenheilkunde*, xvii, 1907, p. 432). In 1904 Enslin collected from literature 26 cases and reported 16 observed by himself. In almost all the deformity consisted in a synostotic skull, scaphocephalus (Turmschaedel), caused by a "premature ossification of the coronary suture."

From this Cohen distinguished another type, the rachitic pseudo-scaphocephalus with ocular symptoms. Criticizing the views of these authors, Krauss concludes that Enslin went too far in attributing the atrophy of the optic nerve to a definite characteristic type of scaphocephalus and that there is no principal difference between this and the pseudo-scaphocephalus of Cohen.

He reports a case of his own in a man, aged 20, with exophthalmus and nystagmus, who, from birth on, could not see well and could now only distinguish light and dark. The ophthalmoscope revealed total postneuritic atrophy of both optic nerves, myopia —13 and —12, no myopic changes of the fundus. The mobility of the eyes to all sides was very much limited; divergent strabismus of right eye, bilateral ptosis, lids could be closed well. The eyes were so prominent that they could be exposed beyond the equator by pushing the lids backward, and could scarcely be repressed into the orbits. The whole forepart of the skull was like a tower and enlarged upwards, the left parietal vertex, at the region of the coronary suture, was flat and retracted like a saddle, the right projecting, the frontal tubera prominent, the temporal, frontal and occipital bones bulged outward, their sutures dehiscant, but filled with intercalary bones. The Roentgen photograph showed enlargement and bulging of almost the whole base, especially the middle cranial fossa, shortening of the orbits and flattening of the posterior portion of the planum orbitale. The left coronary suture was prematurely obliterated, the other sutures and those of the right half of the skull in the state of diastatic ossification.

For the explanation of the deformity, Krauss gives a review on the development of the bones of the skull, emphasizing the carti-

laminous preformation of the sphenoidal, ethmoidal bones and the orbital portion of the frontal bone. A left-sided hyperemia of the meninges with external hydrocephalus increased the intracranial pressure, while simultaneously a premature synostosis of the left coronary suture resulted from the disturbed growth of the bones. The increased pressure produced the deformation of the cartilaginous walls and roofs of the orbits, i. e., the frontal and the sphenoidal bones, body and wings, which brought about a frontal position of the large wings and subsequent shortening of the orbits with indentation of the posterior portion of the orbital roof. The optic neuritis and atrophy were caused by the increased intraocular pressure. The nature of the whole process is attributed to rachitis, of which the patient showed some symptoms.

Krauss gives the following résumé: 1. No principal differentiation is to be made between eye affections in scaphocephalus, rachitis and in other types of deformities of the skull. 2. Exophthalmus, atrophy of the optic nerve and other ocular sequelæ of the deformities of the skull are due to the same cause, only differing in degree and time. 3. Their cause rests in a discrepancy between the insufficient expansibility of the cranial capsule in a certain direction and in the abnormally expanding contents. 4. The base and orbits bear the consequences of these disproportions and suffer a compensatory extension downwards and generally also forward. 5. The cause of this disproportion consists in a chronic inflammatory process of the cranial bones, mostly appearing soon after birth and perhaps dependent upon rachitis. It leads to more or less marked hydrocephalus, premature synostosis of some suture and bilated ossification of the originally cartilaginous parts of the base, according to the stage of development and intensity. 6. Further observations of clinical cases with especial regard to rachitic symptoms and anatomo-pathological examinations will better elucidate these conditions. Roentgen photographs should always be consulted. C. Z.

GLAUCOMA.

RELATION OF THE CIRCUMLENTAL SPACE TO THE CAUSATION OF GLAUCOMA.—TENNEY, J. A., Boston (*Jour. Am. Med. Assn.*, July 27, 1907), examined the eyes of 200 persons of all ages with the Würdemann lamp to see to what extent the lens encroached on the ciliary processes as age advanced, applying the lamp to the margins of the lids at the outer canthus and looking obliquely through the pupil. If the observer looks far enough forward into the normal eye, he sees the ciliary body as a dark ring. The circumlental space is given as 0.5 to 0.6 mm. The lens being about 9 mm. in diameter.

an increase of $1/10$, which, according to Priestley Smith, takes place between the ages of 20 and 60, would cause it to encroach on the ciliary process when "any unusual congestion might cause trouble." The anterior chamber and circumlental space may both be shallow without causing glaucoma. Glaucoma seems to be more common in eyes with a large cornea and in hyperopia. P. H. F.

SURGICAL TREATMENT OF CHRONIC GLAUCOMA.—RISLEY, S. D., Philadelphia (*Jour. Am. Med. Assn.*, July 27, 1907), claims that simple glaucoma, when followed from the incipency of the disease, belongs in the same category as inflammatory glaucoma, although it may progress to blindness without an acute attack. It is advisable to perform iridectomy, if possible, before the fulminant stage. The technique is difficult. The iridectomy should extend to the root of the iris and include one-sixth of its circumference, and should be performed under general anesthesia. The triangular bent keratome should be entered through the corneal limbus opposite the root of the iris. The slow and deliberate withdrawal of the knife is important to allow gradual escape of aqueous. P. H. F.

THE POSTOPERATIVE HISTORY OF SIXTY CASES OF SIMPLE CHRONIC GLAUCOMA; SECOND SERIES.—BULL, CHARLES STEDMAN, New York City (*Ophthalmic Record*, June, 1907). The operation performed was iridectomy; 115 eyes were submitted to operation. Between 30 and 40 years, 1 case; between 40 and 50, 9 cases; between 70 and 80, 4 cases; 27 were men and 33 were women. All native-born Americans. Eighteen had hyperopia; 14 H. As.; 16 H. + H. As.; 8 M. As., and 4 mixed Ast. Both eyes were involved in all cases. Iridectomy was done on one eye alone in 5 cases, on both eyes at a varying interval of time in 49 cases, and on both eyes simultaneously in 6 cases. The visual fields before operation showed concentric narrowing, most marked on nasal side in 70 eyes. There was narrowing on the nasal side only in 35 eyes. There was concentric narrowing with central or paracentral scotoma in 11 eyes. There was loss of entire nasal half in 4 eyes. The tension varied at different times of the day and was higher in the morning. There was a tendency to increased arterial tension and arteriosclerosis. Temporary improvement of central vision after iridectomy occurred in 14 eyes. No permanent improvement of vision in any eye. No impairment of central vision in any eye. Slow but steady failure of central vision in 94 eyes. Maintenance of existing vision in 21 eyes, the longest being 8 years. Immediate diminution of tension in 112 eyes. Permanent diminution in 24 eyes. No permanent effect on tension in 3 eyes. No immediate increase in narrowing of

fields in any eye. Slow but steady diminution of fields in 92 eyes. Absolute glaucoma the final result in 16 eyes. Apparent arrest of the disease as to central vision, condition of field and tension in 21 eyes. The best results from the operation, both as to visual acuity and field of vision, occurred in those cases in which the central vision was the best and the field was the least encroached upon at the time of the operation. The author concludes that the operative treatment of chronic glaucoma is not a certain means of cure and that, while in a certain number of cases there is immediate impairment of vision and even rapid blindness, we must learn to look upon iridectomy, not as a means of cure, but as a method of either arresting the course of the disease or of delaying its progress. Further, that it is not so much the operation which arrests the disease as the early performance of the operation. Iridectomy should be regarded as the first resort rather than the last resort in this disease. While the use of myotics after the operation befores the judgment, yet if their use is omitted the results are more unfavorable.

M. B.

CYCLODIALYSIS FOR CHRONIC GLAUCOMA.—SEWALL, E. C., San Francisco (*California State Journal of Medicine*, May, 1907). The writer is an advocate of the operation of cyclodialysis for chronic glaucoma. He considers sclerotomy almost obsolete; iridectomy, as devised by von Graefe, epoch-making in the history of ophthalmology, and looks to the operation of cyclodialysis, as evolved by Prof. Dr. Heine in Breslau, to be the operation of the future.

The operation frees the anterior chamber and establishes communication between the suprachorioidal space and anterior chamber without removal of the iris. "Professor Heine brings up several questions that naturally arise. Does the communication produced heal immediately and leave simply an iridodialysis which acts merely by freeing the chamber corner? Is not the suprachorioidal space entirely obliterated in a case of chronic glaucoma? These questions a greater amount of experience and material alone will answer."

Professor Heine reports favorably on the operation after fifty performances. Several cases receiving perfect iridectomies at the hands of Professor Uhthoff without a cure were relieved by cyclodialysis. Dr. Sewall has witnessed the operation several times in clinics of Axenfeld and Fuchs, and presented his case to the San Francisco Eye, Ear, Nose and Throat Society. The technique of the operation is given in Professor Heine's words:

"Above or below, temporal or nasal from the corneoscleral limbus,

at a distance from this of 5 to 10 mm., cut through the conjunctiva and episcleral tissue until the sclera is laid bare. Taking hold near the limbus with the forceps, the eyeball is steadied and an incision made parallel to a tangent to the limbus passing through this point. The incision extends to the ciliary muscle and is made with a straight or bent iridectomy lance.

"One takes the lance in the hand as a pen, and the perforation of the sclera can be felt. Make the opening in the sclera about 2 mm. long. Now introduce into this wound a small spatula such as is used for replacing the corners of the iris after iridectomy, taking care to work with the spatula always pressed outward against the sclera. When the instrument is pushed forward as far as the ligamentum pectinatum, some resistance is felt. This is overcome slowly and then the spatula is seen to appear in the anterior chamber. Excursions are now made to each side, so as to separate the iris widely from its basal attachment. The spatula is now slowly withdrawn and more or less of the aqueous can be allowed to pass out as desired. The conjunctival wound is sutured by a catgut suture and eye bandaged. If one has allowed no aqueous to escape, there will be no alteration in the tension immediately following the operation, but becomes apparent in three or four days. The operation is almost painless under cocain and adrenalin and general narcosis is necessary only in children."

Dr. Sewall's patient is a man, aged 53; glaucoma symptoms first noticed in left eye twelve years ago and in right eye four years ago. When the patient presented himself one year ago, V. O. D. with correction (— 2.50) was 20/xl; V. O. S., hand movements; no improvement gained by glasses. Cupped discs, contracted fields, sensitive cornea and plus tension were present. No improvement during about eight months' treatment with pilocarpin. Vision at time of operation was in right eye fingers at four feet and in the left eye hand movements. A general anesthetic was employed, though the knowledge gained by the operator would permit of local anesthesia in future cases. "Patient was kept in bed and quiet for some days. There was absolutely no inflammatory reaction. Pilocarpin was instilled regularly." There was not the immediate decrease in vision sometimes noticed after large iridectomies.

Three months after the operation (to date) the eyes do not present the appearance of having been operated upon. No detachment of the iris is seen. Vision remains the same as before the operation. The tension is decidedly improved, though the regular instillation of pilocarpin is continued.

Further reports upon this case, and of other cyclodialysis operations in this country, would aid us in forming an opinion as to the value of this operation.

H. V. W. AND S. G. H.

RECENT EXPERIENCES WITH CYCLODIALYSIS.—BOLDT, W., Altona. (From the clinic of Prof. R. Deutschmann, Hamburg. *Beitr. zur Augenheilkunde*, 1907, Heft 68, p. 463), reports the clinical histories of 30 cases in which cyclodialysis was performed 38 times on 37 eyes. The results were in general not unfavorable. There were 6 failures, 2 in acute, 1 in subacute, 1 in inflammatory, 2 in simple glaucoma. In the remaining 31 a more or less enduring favorable influence was noticeable. This was remarkable with regard to the material, which generally gave a bad prognosis. A considerable and lasting decrease of tension was noted 25 times. Boldt admits that after longer observations some more failures might be encountered, which, however, might be remedied by repeated cyclodialyses. Cyclodialysis seemed to arrest a further contraction of the field of vision, and in some cases a direct improvement of peripheral vision was obtained.

All in all, according to Boldt's experience, iridectomy is certainly preferable in acute and subacute glaucoma. Cyclodialysis does not seem promising in the prodromal stages, but in chronic inflammatory and simple glaucoma ought to be further tried and may deserve preference to iridectomy, if it will be ascertained that no failure of central vision ensues after the operation in cases with contraction of the visual field to the fixation point. It seems indicated in hemorrhagic glaucoma, as less dangerous than iridectomy, as well as in juvenile glaucoma, and, if associated with very high myopia, perhaps also in dislocation of the lens, chiefly, however, in buphthalmus, followed by treatment with miotics. The suggestion of W. Czermak deserves attention, viz., in certain cases of chronic and absolute glaucoma, in which the performance of a regular broad and peripheral iridectomy is impossible on account of atrophy of the iris and its adherence to the cornea, to combine cyclodialysis with iridectomy and thus to obtain the smooth separation of the root of the iris from the ligamentum pectinatum.

With regard to the objections of W. Krauss (*Ztschr. fuer Augenheilkunde*, xvii, 1907, p. 4, reviewed in this number of OPHTHALMOLOGY, page 89), Boldt answers that the results so far obtained with cyclodialysis encourage to further trials and that the experimental observations of Krauss on animals can not be indiscriminately applied to man, as the healing process on healthy eyes of animals may be much keener than on glaucomatous human eyes. He considers Krauss' clinical anatomo-pathological material of two

cases as too scanty and prognostically so unfavorable as to preclude *a priori* any prospects of operative attempts. Since sufficient attacks of glaucoma occur in which all operative procedures at our command fail more or less, Boldt thinks we are obliged to further test cyclodialysis.

C. Z.

CONTRIBUTION TO THE ETIOLOGY OF INCREASED INTRAOCULAR TENSION.—HESSE, ROBERT, Graz. (From the eye clinic of Prof. Dimmer in the Univ. of Graz. *Ztschr. fuer Augenheilkunde*, xvii, Mai, 1907, p. 424). Hitherto it has been held that the lens may give rise to increased tension in two ways: 1, through dislocation; 2, through swelling of its substance after injuries of the capsule. Hesse could not find it ever mentioned that the slow gradual swelling of the lens in cataracta intumescens may elicit an attack of acute glaucoma. He, therefore, reports two cases of sudden rise of intraocular pressure and all other symptoms of acute glaucoma through the progressive swelling of the lens and subsequent closure of the sinus of the anterior chamber, in previously healthy eyes, now affected with senile cataract. These cases are very important, as they demonstrate that in previously healthy eyes closure of the sinus may produce attacks resembling primary glaucoma, and that uveitis serosa or similar primary inflammatory affections be not necessary to create glaucoma.

C. Z.

ON CYCLODIALYSIS.—KRAUSS, W., Marburg. (From the eye clinic in the Univ. of Marburg. *Ztschr. fuer Augenheilkunde*, xvii, 1907, p. 318). In 1905 Heine devised cyclodialysis, a new operation for glaucoma, which consists in detaching the ciliary body from the sclera to establish a communication between anterior chamber and suprachoroidal space and to reduce the intraocular tension. Heine claimed this action for his operation even if several iridectomies or sclerotomies had been performed without success, and in absolute glaucoma with intense secondary changes. Krauss emphasizes as the salient points: whether through cyclodialysis a dehiscence is obtained which leads, or not, to a lasting communication between the anterior chamber and suprachoroidal space and whether the aqueous is excreted from the latter out of the interior of the eye; 2, whether cyclodialysis is able to free the sinus of the anterior chamber, and, 3, whether this is effectuated better and easier by cyclodialysis than by the procedures so far in vogue and tested in many operations.

In a very minute and objective scrutiny of the observations and assertions of Heine, based on about 56 operations for cyclodialysis, Krauss concludes that cyclodialysis, with regard to theoretical ar-

gumentation and clinical experiences, does not fulfill its object to be an operation for glaucoma.

Since so far no experiments on animals had been made to study these questions, Krauss undertook them on 20 eyes of rabbits and 12 eyes of cats. The results were the same in all: 1. In all cases a solid cicatrix had formed at the site of operation. 2. The vitreous occasionally showed here and between it and the ciliary body slight fibrous bands. 3. The chorioid was always tightly adherent to the sclera. 4. The ciliary body was fixed to the sclera by scar tissue, and the ciliary processes were thickened by cicatrices or atrophic. 5. The iris occasionally appeared atrophic in the region of the detachment and always was adherent to the cornea. 6. The sinus of the anterior chamber was in all cases obliterated; the base of the iris was always adherent to the cornea by cicatricial tissue extending far forwards. 7. The anterior chamber at the side of the cyclodialysis was more shallow and in the sinus fibers and leucocytes were found. 8. The cornea showed detachment of the endothelium and Descemet's membrane, which not infrequently had happened at the operation. A lasting opacity followed there in some animals.

Heine's cyclodialysis produces in the eyes of rabbits and cats cicatricial synechiæ between parts which had been separated by operation. The supplantation of the destroyed normal tissue by scar tissue causes atrophic changes on the detached parts of the eye.

Then follow the clinical histories of two cases of glaucoma, operated on by cyclodialysis, with anatomico-pathological descriptions of the enucleated eyeballs, which also showed that cyclodialysis is not able to establish a lasting communication between anterior chamber and suprachorioidal space.

Finally, Krauss answers the question: If cyclodialysis does not lower the tension, what was the cause in the few cases of Heine's, in which apparently tension was diminished, by the following points: 1. In cases in which aqueous oozed, the puncture of the anterior chamber. 2. Filtration through the opening in the sclera. 3. The damages done to the eye by the operation, especially the atrophy of the ciliary body, to which a number of the eyes operated on were disposed. 4. Iridodialysis instead of cyclodialysis.

Krauss doubts that the sinus of the anterior chamber be lastingly freed by cyclodialysis. Should it be possible, he does not believe that it suffices to give preference to cyclodialysis before other usual operative measures with which the effect may be reached from in front without injury to the eye. The anatomical changes are illustrated on two plates.

C. Z.

ACUTE RISE OF INTRAOCULAR TENSION FOLLOWING A SINGLE CONJUNCTIVAL INJECTION OF A SOLUTION OF CYANID OF MERCURY.—DE SCHWEINITZ, G. E., Philadelphia (*Ophthalmic Record*, April, 1907). The author has used injections of salt solution and cyanid of mercury, 1-5000, for several years, without mishaps. The present case was one of uveitis with punctate keratitis. The disease had made satisfactory progress under mydriasis, subconjunctival injections of salt solution and pilocarpin sweats. A subconjunctival injection was then given of 1-5000 cyanid of mercury. This produced violent reaction with pain, steamy cornea, increased intraocular tension, estimated at $+2$. These symptoms were soon controlled by the use of eserine and in less than twenty-four hours the eye was no worse for the experience. M. B.

CONTRIBUTION TO THE SUBJECT OF THE CAUSATION OF GLAUCOMA BY INTRAOCULAR TUMORS.—PUSEY, BROWN, Chicago (*Arch. Ophthalm.*, March, 1907, xxxvi, 212), reports a case of glaucoma secondary to an intraocular sarcoma, and gives the clinical, macroscopic and microscopic findings. He found "the angle of the anterior chamber open except in one small region. . . . An invasion of the limbus region by pigmented tumor cells completely filling the meshwork of the pectinate ligament, involving the sinus venosus scleræ, and extending along the perivascular lymph spaces deeply into the scleral tissue. . . . Pigmented cells within the lumen of the vessels of Schlemm's canal." Pusey explains the increased tension as follows: "Pigmented cells, which had their origin in the tumor, got into the anterior chamber, thence into the spaces of Fontana, where they acted as occluding particles, interfered with the exit of fluid from the eye, and thereby caused glaucoma." The article is illustrated. W. R. M.

PREPARATORY IRIDECTOMY AND CATARACT FORMATION AFTER IRIDECTOMY FOR GLAUCOMA.—NOYON (*Tydschr. v. Gen.*, Aug. 11, 1906), considers simple extraction indicated for very sensitive patients who would react strongly to the iridectomy and where we desire absolute rest after the operation and with bleeders. Noyon finds only one argument for simple extraction which he can not answer: that capsular remains will not become entangled in the wound. This happens undoubtedly much more easily in combined extraction. The rare cases of postoperative glaucoma with a seemingly well-healed wound are observed only after iridectomy. But to these may be opposed many cases of glaucoma after simple extraction through incarceration, which leads up to the chief argument against simple extraction—the great danger of prolapse of the iris.

Noyon prefers a preliminary iridectomy, which has the advantage that when the extraction will be made the patient already once has undergone an ocular operation, he is accustomed to the necessary rest after the operation, knows the hospital surroundings and his surgeon and is sufficiently trained for the principal operation. The surgeon may have gathered some experience with the iridectomy. The operation is now much easier—a clear operative field, no iris will throw obstacles in the way, no blood from the iris will obscure, and the patient will not suffer any pain. Of course, each case should be individualized, but when the patient accepts the advantage of the double operation the iridectomy can be done when the cataract is not yet entirely operable. An opposite argument is the double danger of infection, but with the great immunity from infection of iridectomy wounds this opposition can be passed by. There remains more trouble and the greater expense, which the patient has to take care of, and the double work for the surgeon, which is only important for him who has to make the most of his time.

The books disapprove in general the division of the operation as troublesome and superfluous in cases of uncomplicated cataract. One writer advises it where there is only one remaining eye. This is a most clear vote of confidence for the procedure.

The psychical influence of this iridectomy should not be underestimated. If everything goes well, then the preparatory iridectomy for the second eye is unnecessary; with obstacles it is advisable, but it is seldom needed.

Noyon trusts that the iridectomy influences the lens opacity; it is very difficult to be sure of it, as the formation of a senile cataract is so often irregular that one can not know how the opacity would have behaved without the iridectomy. Noyon observed two cases of lens opacification after iridectomy which was done for subacute glaucoma in two patients. Three months later cataract developed. A capsule wound was thought of, which might have been made in the one restless patient, but certainly not in the other. The course of a traumatic cataract in men over 60 years of age should be more stormy but irritation symptoms were absent. A rupture of the zonule could have happened on opening the anterior chamber through propulsion of the lens. This rupture would produce a nutritive disturbance of the lens with consecutive cataract. E. E. B.

CONGENITAL HYDROPHTHALMUS SUCCESSFULLY OPERATED ON BY SCLEROTOMY SIXTEEN YEARS AGO.—HIRSCHBERG, J. (*Centrb. fuer Augenheilkunde*, Juni, 1907, p. 173). The left eyeball of the patient, aged 1 year, was very much enlarged with smoky cornea,

mydriasis and increased tension. As the corneal opacity and mydriasis did not yield to instillations of eserine within eight days, sclerotomy downwards was performed in chloroform narcosis. Good recovery with clear cornea after a week. After sixteen years the eye showed normal tension, cornea clear, anterior chamber deep, pupil 4 mm. round and reacted to light. The optic disc was reddish, showed flat excavation and conus, slight pigment alterations in the center of the fundus, i. e., myopic changes. The scars of the sclerotomy were smooth without the least cystoid formation. C. Z.

BUPHTHALMOS CLINICALLY AND THERAPEUTICALLY CONSIDERED.—ABADIE (*La Clinique Ophtalmologique*, June 10, 1907). The writer states that congenital buphtalmos is without doubt among the most distressing maladies, the children who are attacked with it being doomed to certain blindness, while the deformity of their eyes is one of the saddest of objects; for the whole condition, in spite of the great progress of ocular therapeutics, is such that we are helpless as to the cure of this terrible affection. The curative result of iridectomy for glaucoma in buphtalmos furnishes more disasters than successes. Myotics, so useful in the forms of glaucoma in which iridectomy is not justifiable, do not help.

In fact, the nature of buphtalmos is essentially a condition other than glaucoma. There is hypertension and also a secondary excavation of the optic papilla, but there is also the condition of chorioretinitis, and this chorioretinitis is overlooked because the cornea is less transparent than normal and deep exploration of the eye impossible, and later when the fundus can be seen there is found papillary excavation. More often so far no trace of chorioretinitis is discovered, for the reason that in the more equatorial region of the eye and especially in ciliary position, which, being difficult of investigation ophthalmoscopically, the lesion escapes discovery. But if the pupil is sufficiently dilated and the patient's eye directed laterally there may be seen atrophic, discrete spots, and sometimes confluent gray zones bordered by pigment heaps so characteristic of the pathologic change. But if after a careful examination the chorioretinitis is not discovered it should not be concluded that it does not exist. Abadie believes in that case the disease is latent and that as yet no formation of the ophthalmoscopic lesion has been evolved.

Persuaded that in buphtalmos it is the chorioretinitis which plays the fundamental rôle, Abadie now directs his therapeutic measures against that disease, giving intramuscular injections which are more efficacious than inunctions. Abadie claims that in all of

his cases this treatment seems to have produced beneficial results. One case especially in which the right eye was the larger and on which several sclerotomies had been done with no other result than iritic hernia, the hypertension not having been loosened; in this case the mercurial injections improved vision, reduced the volume of the eye, and the tension became normal. B. E. F.

TRANSIENT HYPERTENSION.—DUFOUR (*La Clinique Ophthalmologique*, June 10, 1907). The author calls attention to the fact that more or less of our studies in hypertension have been, in the main, devoted to the continuous condition under the form of acute or chronic glaucoma; that little attention is paid to the slight transient increase of intraocular pressures, which are in reality an important factor. Dufour states that in these cases the patient complains of heaviness of the lids, difficulty of raising them and of ocular movement; this disappears later. The secretion is diminished—conjunctivitis sicca. Dufour believes that these cases of “sec catarrh” are nothing more than nocturnal hypertension, due to pressure on the blood vessels of the neck during sleep while in the recumbent position. B. E. F.

HISTORICAL.

ANCIENT LENSES.—SUPER, C. W. (*Scientific American*, May 25, 1907), in the *Popular Science Monthly*, says that the ancients, as late as the age of Plutarch, knew nothing of spectacles, is clear from the negative testimony of this writer. This philosopher maintained, in common with almost all the thinkers of antiquity, that sight is produced by a sort of fluid substance passing from the visible object to the eye, somewhat in the shape of a cone, the eye being the apex. When the organ becomes weakened by age, this attenuated substance is too intense to permit normal vision; so in order to weaken it the object must be held farther away. He finds a confirmation of this theory in the habits of those animals that seek their prey by night when their sight is most acute. The fluid emanating from the object is too strong to be properly commingled, with the power of vision, as he expresses it, possessed by these animals, but is so weakened and diluted by the surrounding darkness as to enable them to see at their best. M. D. S.

INJURIES.

DOUBLE PERFORATION OF THE EYEBALL BY IRON AND STEEL.—SWEET, WILLIAM M., Philadelphia (*Ophthalmic Record*, July, 1907). Nine cases are reported by the author in which the foreign body was located in the posterior scleral region, having penetrated

the sclera, but had not passed entirely through into the orbit. With the exception of one case, the metal was of large size. Two of these eyes were lost from panophthalmitis and three from iridocyclitis, and in another case enucleation will be required for recurring hemorrhage in the anterior chamber. Thirteen cases are reported in which the metal passed completely through the eyeball into the orbit. The globe was lost in five instances, two because of panophthalmitis, one from iridocyclitis, one from collapse of the ball following an attempt to extract the metal and one in which extraction failed. The author dwells upon the importance of an expert x-ray examination in every instance of ocular injury from foreign bodies. He insists that it is impossible for the surgeon at the time of the injury to determine that perforation of the posterior scleral wall has occurred except by such an examination. In a critical case where it is questionable if the foreign body is inside or outside the posterior scleral wall, the size of the eyeball should be carefully considered. Eyes vary in their size where high refractive errors exist and are sometimes larger in people who have very large heads.

M. B.

A CASE OF HYSTERIA IN WHICH ACCIDENTAL TRAUMA WAS SIMULATED BY PLACING PIECES OF GLASS INTO THE CONJUNCTIVAL SAC.—HEATH, CLARENCE W., Chicago (*Ophthalmic Record*, April, 1907). This girl, aged 16, was an inmate of the Chicago Refuge for Girls. She complained of having gotten some pieces of glass into her left eye on the day before through the breaking of one of her lenses. Five pieces of glass were removed by one of the attendants. Considerable attention was given the girl and she was taken downtown to see the oculist, and in order to continue in that rôle she repeatedly put small pieces of glass in the conjunctival sac, which were removed by the attendants as well as the oculist. Examination of her visual fields showed them to be contracted for white with reversal for colors. General examination revealed her to be a subject of characteristic hysterical attacks. She had areas over the body and extremities of hypalgesia and hyperalgesia.

M. B.

FRACTURE OF THE ANTERIOR FOSSÆ OF THE SKULL, INVOLVING THE OPTIC NERVE ALONE.—PRIDHAM, H. E. (*The Australian Medical Gazette*, June, 1907). A man, aged 41, fell from a building April 21, 1907. He was conscious immediately after, but bled freely from the nose. There was a bruise over the right supraorbital margin. Examination at the hospital disclosed fracture of three ribs, but no fracture or depression of the right frontal bone

could be found. The eyelids of both eyes became extensively ecchymosed, and both ocular and palpebral conjunctivæ filled with blood—more on the right side. The right pupil, on the 22d, did not react to light and was larger than the left. The nervous system was otherwise normal. The patient at no time lost consciousness. On the 22d loss of vision in the right eye was complained of, and there was no perception of light. The red reflex was present, but the light reflex absent. There was paralysis of the ocular muscles or ptosis. Ten days after the accident (May 1) the disc was fluffy at the edges, veins very large, and whitish exudation in the center of the disc. No hemorrhages were seen. On May 8 the outer half of the disc was whiter than the inner. On May 20 the light reflex was absent, perception of light still lost, but the consensual reflex present. Both pupils contracted on accommodation. The whole disc was now white, the arteries much smaller, and the edges better defined than in the other disc. There were shooting pains in the sound eye, but no signs of inflammation.

The lesion seems to have involved solely the right optic nerve, and was probably, therefore, about the optic foramen. The ophthalmic artery would seem to have escaped. A very similar case is described in the *Lancet*, Jan. 21, 1905, and the subject is also discussed in the annotations of the same number. From the literature it seems uncertain whether the lesion was a hemorrhage into the optic nerve sheath or division of the nerve by a splinter of bone from the anterior clinoid process.

F. A. AND P. G.

PANOPHTHALMIA AFTER PENETRATION OF A WHIP LASH INTO THE VITREOUS CHAMBER.—VIGIER (*Annales d'Oculistique*, February, 1907). There was a perforating wound of the sclerotic with hernia of the ciliary body and the eye soon became violently inflamed and intensely painful. Six days later (why not immediately?) the ball was enucleated and a piece of whip lash four centimeters long was found within it.

G. C. H.

CASE OF TRAUMATIC ENOPHTHALMOS.—CHAILLOUS (*Ann. d'Oculistique*, September, 1906), reports a case following fracture of the superior maxillary.

G. C. H.

REPORT AND COMMENTS ON THE EYEBALL INJURIES BY IRON FOREIGN BODIES AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE, NEW YORK CITY.—KNAPP, H., and STOLL, LOUIS. New York (*Arch. Ophth.*, July, 1907, xxxvi, 485). The authors previously reported (*Archives of Ophthalmology*, xxxvi, 1) a series of 22 cases of penetrating injuries to the eye, and now add an addi-

tional series of cases. These cases are grouped according to the location of the foreign body, and in this series the authors report 30 cases in which the foreign body could not be seen with the ophthalmoscope, but were extracted from behind the lens. The clinical history, method of removal of the foreign body and after-results are given. In 9 cases the foreign body was removed through the original wound, the remainder of the cases requiring a new incision. The visual results varied from 20/xx to light perception. Ten cases showed evidences of infection on admission to hospital, and of these seven were saved.

W. R. M.

OPHTHALMOSCOPIC CHANGES CAUSED BY PIECES OF IRON IN THE INTERIOR OF THE EYE AND THE MAGNET OPERATION.—HIRSCHBERG, J., Berlin (*Centrbl. fuer Augenheilkunde*, April, 1907, p. 98). Not much attention has been paid to these conditions in ophthalmoscopic atlases, although they are of great practical importance. Hirschberg gives in detail the clinical histories of two cases, representing the two chief types of cicatrices remaining after successful extractions of foreign bodies, viz.: the simple and the one characterized by a bluish-white pyramid in the vitreous spreading towards the point of entrance.

The third case showed in a classical form the progressive changes of pigment, subsequent to the obstruction of retinal arteries by the entering piece of iron in spite of its uncomplicated extraction, with hemeralopia due to the pigment degeneration, not to toxic action on the ganglion cells. The nasal retinal arteries were converted into bluish-white streaks and the vitreous contained opacities interwoven with threads and membranes. Hirschberg emphasizes that the effused blood was not absorbed eighteen months after the accident and that the changes of the fundus were not yet completed. The conditions are illustrated by drawings.

C. Z.

ON EYE INJURIES CAUSED BY THE EXPLOSION OF THE ROBURIT FACTORY AT WITTEN AND THEIR MECHANISM.—STOEWER, DR., Witten (*Klin. Monatsblaetter fuer Augenheilkunde*, xlv, Maerz, April, 1907, p. 347). An explosion and fire at the factory on Nov. 28, 1906, attracted a great many spectators, among whom a second explosion caused great havoc by serious injuries and deaths. The eye injuries, of which 34 came under Stoewer's treatment, were mostly produced by sharp and blunt foreign bodies, partly by the enormous compression and subsequent rarefaction of the atmosphere.

Of the former, the following case is described in detail: A man, aged 18, had a wound 3 cm. long over the left eyebrow, the upper

lid suffused by blood, eyeball not injured. But there was paralysis of the abducens, lack of direct pupillary reaction, fundus normal, $V. = 0$, which suggested an interruption of the optic nerve behind the entrance of the retinal vessels by a lesion of the bone at the optic foramen. The frontal sinus was found to be open and its inner wall fractured, with exposure of the brain. Death after two weeks. The postmortem corroborated the above assumption. The posterior ethmoidal cells and orbit were fractured and the cavernous sinus lacerated (n. abducens).

Emphysema of the lids in another case apparently was due to pressure of the eyeball against the lamina papyracea and subsequent infection of it.

In the remaining cases all symptoms of the impact of blunt forces were lacking, as superficial erosions of lids or eyeballs, so that Stoewer feels inclined to attribute the cause to air pressure. This was so great that all windows and mirrors, on streets 2 to 3 kilometers distant were broken, walls and ceilings fissured, iron supporters and matches bent, and massive houses torn apart. People were thrown through the air and there were innumerable perforations of the drum heads. The overcoat of a man, which was buttoned up, had a longitudinal tear through its whole length, collar included, as well as trousers. Stoewer explains this by the rarefaction of air following the condensation. The air enclosed could not escape fast enough through the openings of the clothes and forced its way out by tearing them similar to an explosion. Applying this mechanism to the eye, the air enclosed under the upper lid tore this by sudden expansion. At first the eyeballs were pressed into the orbits. The suction of the following rarefaction pulled the eyeballs forward and caused intraocular hemorrhages, iridodialysis, dislocation of the lens, rupture of the capsule and traumatic cataract, tears of Descemet's membrane with subsequent deep-seated opacities of the cornea, hyphema. A case of typical acute glaucoma is ascribed to obstruction of the sinus of the anterior chamber by edema of the ciliary body in consequence of paralysis of the vasomotor nerves. C. Z.

INSTRUMENTS AND METHODS OF EXAMINATION.

A MODIFIED SPECTACLE FRAME.—WOELFFLIN, E., Basel (*Centralbl. fuer Augenheilkunde*, Juni, 1907, p. 174). To better adapt the frame to the dimensions and configurations of the face and nose, Woelfflin made the bridge of pliable metal, of copper and an alloy of lead. Thus by bending the bridge according to the nose the height of the bridge can be easily changed and the distance

from the eyes and between the pupils exactly regulated. The frames are manufactured by Hausmann, 15 Freie Strasse, Basel. C. Z.

PARABOLIC REFLECTOR FOR THE ILLUMINATION OF TEST TYPES.—FRANK, M., Chicago (*Jour. Am. Med. Assn.*, Aug. 3, 1907), has devised a reflector which can be so placed with reference to a test card that the rays of maximum intensity will fall near the bottom of the card, while those of less intensity will fall near the top, and we thus approximate uniform illumination, even though the light source be much nearer one end of the card than the other. The reflector is tipped at an angle of about 25° from the horizontal, and the top of the test card should be about 15° below a horizontal plane passing through the lamp. A candle power of from 3 to 50 can be obtained. P. H. F.

LOCALIZING METHOD FOR RADIOGRAPHIC EXAMINATION OF THE EYE.—POWER, HENRY, Spokane, Wash. (*Northwest Medicine*, May, 1907). The writer has devised an ingenious method of estimating the location of a piece of steel within the eye. Supposing the right eye to be searched, "the patient is placed on the horizontal plate with the right side of the head on the same, the head being so rotated that the plate comes as near as may be to the prominence of the malar bone, the zygomatic process and the side of the frontal bone."

Suspended at a known distance from the plate, say ten inches, to left side and in front of the patient's head, is a lead straight edge with its surface parallel to the plate and its edge parallel to the profile of the face. A copper or lead wire an inch in length and of about 24 gauge is fastened by adhesive plaster on the skin surface of the lower lid and perpendicular to its free border.

The Roentgen tube is stationed about twenty inches from the plate, perpendicularly above the eye, and a moderate exposure is made. The tube is now shifted a convenient distance and parallel to the free edge of the straight edge and a second exposure obtained on the same plate. Exposures from the same directions on a second plate verify the findings of the first. Measurements are made of the distance between the two shadows of the lead straight edge. Supposing this distance to be two inches, a proportion may be computed: "Two is to ten as the distance between the two shadows of the copper wire marker is to its distance from the plate. Again, two is to ten as the distance between the two shadows of the foreign body is to its distance from the plate." The distance of the foreign body from the marker is now known and an inspection of the plate tells which portion of the marker the foreign body lies behind.

Two cases are cited and their radiograms printed. At the time of the operations the magnet confirmed the estimated locations. In the first case the foreign body was situated in the lower portion of the posterior chamber, and in the second case the foreign body was in the lower border of the anterior surface of the lens. The size of the piece of steel in the second case was very accurately estimated.

H. V. W. AND S. G. H.

MODEL OF AN ENDOPHTHALMOMETER FOR MEASURING THE DETAILS IN THE BOTTOM OF THE EYE.—DR. EMILIO F. MONTANO, Mexico (*Anales de Oftalmologia*, February, 1907). Measurements are generally made of hemorrhages, the caliber of the exuding vessels, etc., of the bottom of the eye, by using the diameter of the pupil as the unit of measure. As this diameter varies physiologically, he has invented a measuring apparatus which he calls an endophthalmometer and consists of a common lens of an ophthalmoscope of fifteen diopters of refracting force, fixed to a stem perpendicular to the plane of the lens, and, besides a pentagraph with meshes of 4.4 mm. on each side, fixed on the same stem, parallel to the lens and distant from it 62.5 mm. When examining the eye this apparatus is interposed as if it were an ordinary ophthalmoscope; the image of the bottom of the eye is formed, as calculated, at 62.5 mm., and as it there meets the pentagraph one can see its size in millimeters. The pentagraph is graduated as indicated by the author, for the inverted image is 4.4 times larger than the object and, therefore, in order to measure it by millimeters, the meshes of the pentagraph must be 4.4 mm.

J. DE J. GONZALEZ.

DEMONSTRATION OF AN APPARATUS FOR GRAPHIC REGISTRATION OF THE INTRAOCULAR PRESSURE.—WESSELY, CARL, *Berlin* (*Berliner Ophthalmol. Gesellschaft*, Jan. 17, 1907. *Berliner Klin. Wochschr.*, 1907, No. 15, p. 437). The apparatus consists of a manometer whose zero point can be so adjusted that neither intraocular fluid is lost nor the intraocular pressure changed by the procedure itself. The Hg. column acts on a Marey's capsule with a pencil, and communicates with the interior of the eye through a puncture canula of Leber. The amount of fluid necessary for causing an impression on the very fine rubber of the capsule is 1 mm. under intraocular pressure of 20 mm. Hg. The changes of intraocular pressure are parallel to those in the blood pressure, e. g., after stimulation of the pneumogastric nerve; it rises and falls, after excitation of the sympathetic, with the increase of blood pressure and with the action of the vasoconstrictors. After subconjunctival injection of a 10 per cent. salt solution, the blood pressure of the

eye rises with simultaneous increase of albumin in the aqueous to 1 per cent. Intraocular tension and percentage of albumin decrease to normal or subnormal values, parallel to the diminishing contents of salt in the conjunctiva. C. Z.

A NEW INSTRUMENT FOR MEASURING THE INTEROCULAR DISTANCE.—MADDOX, ERNEST E., Bournemouth (*Ophthalmoscope*, June, 1907). The instrument is constructed of two strips of metal which ride one on the other. The left hand ends are bent up at a right angle, but the bending is so done that the plane of the bent surface is at an angle of 45° to the long diameter of the instrument. Mirrors are then fitted to these opposing surfaces. With the instrument held on the flat and crosswise between the patient and the observer, the patient sees one mirror and the observer the opposing mirror, or the one on his right. An image of the patient's right eye falls upon the mirror on the left and is reflected across to the right mirror. In the meantime the observer has so held the instrument that he has lined the center of the right mirror with the left eye or the left pupil of the patient. The strips of metal are now slid so that the mirrors become nearer or further apart as is needful to bring the right eye of the patient as seen in the right mirror by the observer exactly under the left eye of the patient as seen on the center of the same mirror. The pupillary distance can now be read off on a scale stamped on the under sheet of metal. One precaution is essential: the instrument should be held strictly at right angles to the observer's visual line. M. B.

STUDY OF THE STEREOSCOPE.—PIGEON (*Ann. d'Oculistique*, September, 1906), describes the various forms of stereoscope, with illustrations, and suggests that it is not necessary for the pictures to be monochromatic or for both to be of the same color. The two pictures, whose fusion gives the stereoscopic sensation of space, may be of different colors which may be combined in the fusion. The fusion, for example, of two colors in each picture may be made to produce four, or three colors six. G. C. H.

AN ALTERATION OF GRATAMA'S APPARATUS.—KOSMIG, W. (*Tydschr. v. Gen.*, Aug. 11, 1906), fixes the optotypes to the tubes, which brings them at the same time nearer to the patient. The tubes are made towards the sides of the eyes, so that the examiner can observe constantly the eyes of the patient, preventing that he shut one eye for obtaining insight in the nature of the process. The apparatus of Gratama consists of two parallel tubes, tightly connected; the patient looks through these at two sets of test types

at a distance of five meters. The optical axes of the tubes converge, so that the right eye can see alone the left, and the left eye alone the right test type; the impression, however, is made that each eye sees the type hung at the same side. Koster unmasked thus a refraction anomaly of 7 D. myopia, which could not be found out skiascopically on account of maculæ, which disturbed the shadow motions, and where amblyopia was accepted, though correction of the myopia made vision $\frac{1}{2}$. E. E. B.

VARYING INTENSITIES OF LIGHT IN FUNDUS EXAMINATIONS.—SUKER, G. F., Chicago (*Jour. Ophth. and Oto-Laryng.*, May, 1907, i. 43), advises that all ocular and intraocular examinations be made under varying intensities of light, and mentions various ocular lesions that might escape observation when examination is made with an intense source of illumination. He advocates the use of from 3 to 20 c.p. W. R. M.

THE OPTOTYPES OF GUILLERY AND LANDOLT.—KOSTER, W. (*Tydschr. v. Gen.*, Aug. 11, 1906), considers the point-shaped optotypes of Guillery, the use of which consumes much time. The opposition, that they can not serve for examination of the visual acuity, because the recognition should depend on the strength of the illumination, is valueless, as the same condition prevails with ordinary optotypes. The dark points on white background of Guillery will not be seen any more, when the retinal image has become so small that it only covers a part of the diameter of a cone; the light which falls on the margin of the cone irritates it so strongly that the impression equals with the illumination of the surrounding. And when the light becomes twice as strong, it does not change the relation of the light-powers on the single cone and its surroundings and the black point will thus remain invisible. This relation is for the single cone about 0.5 for most men, which means that if half of the surface, or 0.7 of the radius of the section is taken by the point-surface, it is not more seen. To a certain extent the *minimum separabile* between two objects is measured; these objects are here the opposing margins of the black points. This distance transferred to the retina does not mean the distance between two cones, that is the width of one cone, but its 0.7th part.

With Snellen's test types we have the same with many letters, n. 1 where one single black line stands on a white field, as in the letters T and L. Only for some rows of perpendicular lines with the same width between them the recognition angle for every subdivision equals the angle under which the cone receives its light. No reasonable objection exists, therefore, against Guillery's optotypes,

in opposition to Landolt in the second edition of Graefe-Saemisch.

The strength of the illumination must have great importance with Landolt's rings. Landolt opposes that comparison with these bad test types can give only bad results. A system as Landolt's can only be right with white rings on black background; the interruption must, however, not be larger than 0.5 minute for the limit of the visual acuity, and not as it is now published of one minute. One difficulty remains at the limit; the place of the interruption is still recognized, not as a cut-out, but the ring seems closed and thinner at this place. This makes the practical use somewhat difficult.

Koster made rings, white on black, thickened at the interruption place, which means that when the interruption is seen under an angle smaller than one minute the rings give the impression of being closed and to be everywhere of the same breadth. Twelve sizes are put on a board on movable discs. On the back of the board are white rings of everywhere the same breadth; the diameter is here, however, seven times the breadth of the others, five times as of those of Landolt. The chief objection is the amount of time the method necessitates. (See also v. Graefe's *Archiv.*, Bd. 64, Ht. 1.).

E. E. B.

ON THE DISCOVERY OF INTRAOCULAR BODIES BY ROENTGEN RAYS.—HAMBURGER, C., Berlin (*Klin. Monatsblätter fuer Augenheilkunde*, xlv, Mai-Juni, 1907, p. 511). Although the sideroscope is principally preferable to the Roentgen rays, it is not reliable in some cases of very small pieces of steel, not to speak of pieces of copper and lead, by interference of electric cars or cables in large industrial centers and cities. The usual method of calculating the seat of a foreign body from the differences of its position with regard to a certain mark in the various Roentgen pictures was more or less troublesome. Therefore, Hamburger devised a new very simple method, based on the principle of elementary optics, that the shadow of an object is the sharper the nearer the receiving screen is to the object and the less distinct the farther it is from it. In the first case the umbra is obtained, in the second the penumbra.

Hamburger ascertained that this difference of the outlines of shadows exists also in Roentgen rays. In the principle lies also the limitation of the method, since the plate must be approached to the eye as much as feasible, to get a photograph, from the temporal and nasal sides, and this is possible only in foreign bodies in the anterior half of the eye. These are, on account of the more favorable chances for a foreign body to land in the anterior portion of the eye, probably more frequent. For illustration four such cases are reported.

The exposures are done in the following manner: A monacle plate, 7 cm. long, 3 to 4 cm. high, is held by a flexible metallic clasp on a headband vertically to the frontal plane and, closely to the eye, adjusted as far back as possible between eyeball and orbital walls at the nose and temple, not outside the temple. If the patient should slightly move, the plate, being fastened to the head, moves in the same sense. With the nasal monacle the exposure lasts six to eight seconds, with the temporal two to three times longer, because the rays must then pass through the whole skull.

The reliability of Hamburger's method was first tested on enucleated eyes, then on enucleated eyes placed into the orbits of skeletons and finally on cadavers, and was corroborated on two patients of Professor Hirschberg. The nasal exposure in one revealed the foreign body distinct, the temporal ill-defined, corresponding to its nasal seat. In the second case a man had been shot in the face. Some shots were lodged in the temporal portion of the orbit between eyeball and temple. The nasal exposures were indistinct, the temporal ones clearly and sharply outlined.

The procedure is so simple that it ought to be given a trial in every case in which the nature of the foreign body or other conditions exclude sideroscopy. If neither of both monacles shows a shadow, the foreign body is, if at all in the globe, in the posterior segment and the method is not applicable, so that one of the numerous other methods must be resorted to. If the plates show, in repeated exposures, no marked differences in their outlines, the foreign body lies in, or near to, the median line. If there is a decided difference of contours of the skiagram, with or without loupe, the two monacles directly indicate whether (1) the foreign body lies in front or back; (2) up or down; (3) nasal or temporal. The quadrant is thus identified.

C. Z.

MODERN METHODS OF PHOTOMETRY (ILLUSTRATED).—QUITTNER, VICTOR (*Scientific American Supplement*, June 8, 1907), states that, although it is possible to make comparison of light intensities by purely subjective methods based on the properties of silver or selenium salts, that since no known substance obeys the same laws with regard to light which the human eye does, the latter must be the final judge. The standard unit of measurement in Germany, the old standard candle being discarded, is called a Hefner candle power, designated HK, which represents the horizontal radiation of a standard acetylene lamp of prescribed dimensions.

All photometric methods and apparatus are based on the law that the illumination of a surface is proportional to the power of the

source of light divided by the square of its distance from the surface. In the various apparatuses, light from a standard source and from the one being examined are thrown on a screen which can be moved until the intensities of the adjacent illuminations are equal, when the illumination of the lamp being tested can be compared with the standard lamp by the relative distances of the two lamps from the screen.

He described the simple Bunsen grease spot photometer which has a mean error of from 1 to 3 per cent., the Lummer-Brodhun prism photometer, an improved form of which, called the contrast photometer, has a mean error of only $\frac{1}{4}$ per cent., and also Weber's photometer, which can be used for measuring either the candle power of a source or the illumination of a surface. He discusses the meaning of the terms horizontal, maximum, spherical and hemispherical intensities of illumination, and describes Ulbricht's hollow spherical globe by which the spherical and hemispherical candle power of a lamp can be measured.

Artificial sources of light do not emit rays of equal intensity in all directions, and, as an example, he gives the distribution of light by an arc lamp. No light is thrown directly upward, and the greatest intensity in any direction upward is only 150 HK. In the horizontal plane it is but 200 HK, below which it increases very rapidly to 1,165 HK in a direction about 35 degrees below the horizontal, and then decreases as rapidly to zero at 60 degrees and below.

He says that the artificial illumination of office and school desks varies from 20 to 100 lux, one of which is the illumination of a standard Hefner candle 1 meter distant. For reading, 50 lux is found to be as satisfactory as ordinary daylight, but illumination of less than 10 lux injures the eye. Diffused daylight varies from 2 to 3 lux on a cloudy to 400 on a bright day. Direct sunlight, according to Michalke, equals 60,000 lux and according to Weber 150,000.

M. D. S.

IRIS.

HISTOLOGY OF IRIDECTOMY.—HENDERSON, T., Nottingham (*Ophth. Review*, July, 1907), has made a study of 33 globes. The severed iris tissue never shows any signs of scar or reaction, and even years after appears as if cut postmortem. The iris is composed of a vascular layer of loose connective tissue bathed and surrounded by lymph. Simple trauma, iridectomy, does not disturb the relations of the severed tissue cells either to each other or to their normal surroundings, so that there is no stimulus to cause the cells to hypertrophy and lay down a dense and protective layer of

cicatrization and sclerosis, except in the special and exceptional case of a stimulus having been supplied by toxic or other agents.

P. H. F.

ELEMENTS OF THE BLOOD AND THE ETIOLOGICAL DIAGNOSIS OF IRITIS.—TERRION and CAUXNET (*Arch. d'Ophthalmologie*, May, 1907), assuming that all iritis, aside from that due to local ocular infection, is a localization in the iris of a general malady, even if this general malady can not be discovered, have made a systematic examination of the blood in this affection. They conclude that in syphilitic iritis arising in the course of acute infection, there is a nearly normal number of leucocytes of mononuclear form. In non-syphilitic iritis arising in the course of acute infection, there is a decided leucocytosis; the leucocytes preserve their normal equilibrium, or, if this is destroyed, it is in the direction of polynucleosis. These results, derived from general pathology, do not always suffice to determine the origin of an iritis, but may, in some cases, assist in deciding a doubtful diagnosis.

G. C. H.

CONTRIBUTION TO THE STUDY OF THE MOTOR INNERVATION OF THE IRIS.—DUBOIS and CASTELAIN (*Arch. d'Ophthalmologie*, May, 1907). It was thought for a long time that the only dilator nerve of the iris was the sympathetic, but Balogh and Vulpian have shown that reflex dilatation occurs after ablation of the superior cervical ganglion. Vulpian suggested that the filaments that control the dilatation of the pupil after the ablation of the ganglion might connect with the brain through the vertebral nerve, but found later that the pupil still dilated after removal of the thoracic ganglion, and concluded that dilating fibers must be furnished by cranial nerves, probably the trigeminal, as section of this nerve causes contraction of the pupil of the corresponding side.

According to Francois-Franck, the iridodilators form a double system. Some, which belong to the sympathetic system, and in the ganglion of Gasser through the anastomosis which connects this ganglion with the superior cervical; and others, of encephalic origin, reach the ganglion of Gasser through the trigeminal.

Bechterew maintains that the enlargement of the pupil following painful excitations is not a reflex dilatation, but an inhibition of the constrictor.

Spatella, Angelucci and Anderson deny the existence of iridodilators in the trigeminal because they found the reflex abolished after the combined section of the sympathetic and the oculomotor.

The authors, after experiments on dogs, conclude that:

1. The simultaneous section of the sympathetic and the oculo-

motor is necessary to abolish the reflex dilatation consequent to excitation of a sensitive nerve or of the cerebral cortex.

2. That the trigeminal is not concerned with the transmission of this reflex.

3. That excitation of the oculomotor nerve excites contraction of the pupil.

Their experiments confirm observations made by other investigators. G. C. H.

CIRCUMSCRIBED ATROPHY AT THE SMALL CIRCLE OF THE IRIS IN INCREASED INTRAOCULAR TENSION.—HIRSCHBERG, J. (*Centrbl. fuer Augenheilkunde*, Juni, 1907, p. 162). Five years ago Hirschberg wrote: "The circumscribed atrophy of the iris is common after an acute attack of increased tension. I saw the elongated bluish gray patches in the small circle, even if the attack had lasted only from one to two days, in eyes which I had found healthy before." By his regular examinations of a larger number of glaucoma cases with the loupe, Hirschberg observed the following: 1. Lasting circumscribed mydriasis occurs in some cases of slightly inflammatory glaucoma with almost normal vision and visual field, which yield to eserine. It is due to corresponding circumscribed atrophy in the small circle of the iris. 2. If a healthy eye with good vision has once been successfully operated on after an acute attack of glaucoma, bluish depressed spots in the small circle of the iris are frequently met with, the pupillary action being preserved. 3. In all cases of inflammatory glaucoma in which poor vision and visual field have been restored by operation, but which show permanent mydriasis after a few years, circumscribed atrophy in the region of the small circle is found. 4. In glaucomatous degeneration atrophic patches are noticeable in the small and large circles of the iris. Iridectomy, if necessary, must, of course, be performed in the non-atrophic portion of the iris. Three illustrative cases are reported with drawings. C. Z.

TWO CASES OF UNILATERAL FUNCTIONAL MYDRIASIS.—BUTLER, T. HARRISON (*Ophthalmoscope*, May, 1907). A governess of 19 years of age of hysterical temperament developed transient mydriasis of the right pupil with suspension of accommodation. Correction of an hypermetropic error prevented further attack. Her mistress contracted a pneumococcal ophthalmia accompanied by a widely dilated pupil and paralysis of accommodation. M. B.

A CASE OF MYDRIASIS CHANGING INTO MYOSIS BY BENDING OF THE HEAD.—COPPER, H. (*Wiener Klinische Wochenschrift*, May 2.

1907). The patient was 19 years old; he experienced a severe pain in the left eye whenever he bent his head. Examination showed the left pupil wider than the right one, and it did not dilate in the dark; the reaction for convergence and accommodation was considerably diminished in the left pupil; it was, therefore, supposed that there existed in the left eye a syastic mydriasis produced by an irritation of the sympathetic nerve. It was quite evident that every time the patient bent his head there appeared a strongly marked myosis; when the head was straightened out the myosis would still continue for about ten seconds, then the pupil would gradually dilate, and after thirty-five seconds it would again assume original dimensions; the right pupil showed no change at all. When a 2 per cent. cocain solution was instilled into the left eye no myosis appeared at bending of the head; the pain experienced by the patient was due to the sudden contraction of the sphincter. These symptoms were usually brought about by enlargement of the thyroid, by swelling of the lymphatic glands and by an anuerism.

The radioscopic examination showed in this case the existence of numerous swollen lymph glands, especially in the posterior mediastinal space, due to tuberculosis. The aorta was displaced to the left. While bending the head there is a contraction of the sternocleidomastoid muscle, whereby the enlarged mediastinal lymphatic glands press against the sympathetic nerve.

The instillation of cocain may be employed as a therapeutic measure to alleviate the painful contraction of the sphincter of the pupil.

J. G.

CONTRIBUTION TO MEASURING THE PUPILLARY DISTANCE.—
HELMBOLD, R., Danzig (*Ztschr. fuer Augenheilkunde*, xvi, Ergaenzungsheft, p. 45). The apparatus consists of two mirrors forming a right angle, and by two adjustable upholstered rests for the lower orbital margins on a crossbar, cutting the planes of the mirrors at an angle of 45° , the distance of the orbital margin is regulated. If both eyes are equally distant from the crossbar, the visual axes strike the mirrors at angles of 45° and the left pupil will appear on the retina of the right eye and *vice versa*. A rod, adjustable in a plane, bisecting the angles of the mirrors and parallel to the line of intersection, is brought in such a position that it appears to bisect both pupils. Then the double distance of the rod from the line of intersection equals exactly the pupillary distance. The apparatus is made by Gebrueder Penner, Danzig.

C. Z.

LACRIMAL APPARATUS.

DELAYED DEVELOPMENT OF THE LACRIMAL-NASAL DUCT.—JACKSON, EDWARD, Denver (*Ophthalmic Record*, July, 1907). Lacrimal obstruction manifested immediately after birth, or so soon as the secretion of tears is thoroughly begun, should be regarded as due to delayed development of the nasal end of the lacrimal duct, unless evident disease within the nose or in parts immediately adjoining the lacrimal passages offer a different explanation of the case. The destruction of the septum between the lacrimal duct and the nose is a process of physiologic development. The treatment, therefore, should consist in controlling the inflammatory process by palliative treatment until patency of the nasal end of the duct is established. This treatment consists in the careful pressing out of the contents of the sac and the instillation in the eye of a weak solution of protargol or argyrol at short intervals. The author insists that this treatment should be carried out, so long as it controls the symptoms, for several months before operative interference is justifiable.

M. B.

TREATMENT OF LACRIMAL OBSTRUCTION.—STEVENSON, M. D., Akron (*Jour. Am. Med. Assn.*, July 13, 1907), excludes cases of epiphora due to psychic or reflex causes, refraction error or hypersecretion. The treatment of the upper portion of the lacrimal tract, including the puncta and canaliculi, has been discussed and is well understood, but the lower portion, that part of the nose into which the nasal duct drains, is very important and is often overlooked. Pathological conditions here are the most common cause of inflammation and disturbed drainage above. The middle portion, comprising the nasal duct and lacrimal sac, is less accessible and treatment correspondingly unsatisfactory. Obstruction of the upper and lower segment should be the first steps. In purulent disease of the sac, conservative treatment should be tried, the sac being pressed out frequently and allowed to aspirate antiseptic solutions on removal of pressure. One canaliculus should usually be slit. Where there is much swelling, ice should be applied and probing deferred on account of the danger of making a false passage. In many simple cases, dilatation of the puncta and of the canaliculi, without slitting; syringing, the use of mild astringents, and massage of the sac will effect a cure. Probing of the nasal duct should be a last resort. A hypodermic syringe may be used when the canaliculi are small. Swelling of the inferior turbinate easily causes engorgement of the venous plexuses about the lacrimal passages and so causes obstruction due to swelling of the mucous membrane. Adrenalin

or silver nitrate to the nasal region about the orifice or slit-like valve of the duct may cut short an attack of epiphora. Cauterization or amputation may be necessary. Probes need not be passed completely into the nose in order to establish drainage, as there is danger of injuring or compressing the membranes of the lower segment and thus giving rise to strictures or granulation tissue about the outlet. As most strictures are at the upper end, the best procedure is to probe as far as the first obstruction and then try syringing, probing further only in case a second stricture is found. Very small probes are apt to produce false passages in the nasal duct. Large probes injure the tissues and produce a lumen capable of transmitting not only air, but secretions. Medium-sized, blunt-ended probes are best. The sac should be extirpated when pus or mucopus can be pressed out of it, especially in eyes frequently exposed to injury (farmers, stone cutters, mechanics), in bilateral dacryocystitis when one eye has been lost by hypopion keratitis, in severe ulceration of the cornea with infected or obstructed lacrimal passages, preliminary to operations opening the globe; in chronic blennorrhea without apparent obstruction when normal drainage can not be restored; when lacrimal fistula is present, the bony walls of the canal are necrosed or diseased, the sac atonic or dilated; in polypus or marked thickening of the lining membrane, tubercle and malignant growths, and, finally, in nervous patients who can not stand probing, especially in the insane. The concensus of opinion is against removal of the lacrimal gland. Epiphora alone should never lead to probing until actual obstruction is found. Tearing in dacryocystitis is due to reflex stimulation by retention of irritating matter and disappears after removal of the sac. Prince and Holmes are in favor of removing the gland. Extirpation relieves patients of the misery and loss of time in probing. P. H. F.

FRONTO-ORBITAL MUCOCELE.—ROLLET (*Revue Generale d'Ophthalmologie*, May 31, 1907). This paper, its author states, is an extract from the seventh volume of *l'Encyclopedie francaise d'ophthalmologie*, now in press; a full translation of it only would be satisfactory, but it is of too great length for that; an abstract of it could not do it justice. B. E. F.

LENS.

THE NORMAL LENS.—MLLE. TONFESCO (*Annales d'Oculistique*, August, 1906). This elaborate article is the result of studies in the laboratory of comparative histology in the Museum of Natural History. The author reaches the following conclusions:

The suspensory ligament of the lens is of mesodermic origin.

This is distinctly shown by the study of it in the animal series. Its development seems to be early and to correspond with the vascular system of the eye. Its fibers appear to traverse the ciliary body and to be merged in the elastic network that covers the ciliary muscle. There seems to be a relation between the development of the ciliary muscle and the strength and arrangement of the fibers of the suspensory ligament. The fibers of the suspensory ligament are attached to the walls of the capillary vessels of the vascular sheath of the embryonic lens, and in the adult they seem to persist as a network of fibers which surround the lens.

Three varieties of cells are found in the anterior chamber: 1. Large clear central cells which seem to take an important part in the nutrition of the lens; 2, small active peripheral cells, provided with numerous prolongations, which seem to be concerned in the defense of the lens against external influences; 3, equatorial formative cells, whose function seems to be the regeneration of the lens. These three varieties of cells represent the three stages of evolution of the crystalline cell.

G. C. H.

THE EMBRYONIC HISTORY OF THE LENS IN BDELLOSTOMA STOUTI IN RELATION TO RECENT EXPERIMENTS.—STOCKARD, CHARLES R. (*Amer. Jour. of Anat.*, vi, 4, 1907), studying the development of the brain and special sense organs in bdellostoma, has been impressed with the manner in which the history of the lens in these embryos seems to corroborate the conclusions drawn by the experimenters. Very early embryos of bdellostoma in which the nose is still a single tube, and in which six or seven gill slits are present on the laterally outspread plates, will show the lens in the following condition: A small anterodorsal portion of the irregularly-shaped optic-cup comes in contact with the ectodermal head-wall, and from this ectoderm a projection of cells extends inward toward the cavity of the optic-cup. The lens-bud is thus to an extent conical in form and results from a contact of only a portion of the optic-cup with the ectoderm. This structure continues to develop for a time until in an embryo considerably more advanced and measuring 15 mm. in length one sees the lens-bud with a slight indication of a constriction about the periphery of its area of union with the ectoderm, as if it were preparing to pinch off. Here the progressive development of lens ceases and degeneration begins. An older embryo in which all the gill clefts have appeared, and in which the nose exists as two parallel tubes, shows the lens much reduced in extent. The optic-cup is now well separated from the ectodermal wall and a considerable layer of mesenchymous tissue is

seen between the two. The lens is indicated only by a slightly thicker area of ectoderm over the deeply buried optic-cup. In all embryos older than this one, no indication whatever of a lens-like thickening could be found, the ectoderm over the eye region being of the same thickness as that of adjacent areas.

The embryos of *bdellostoma* illustrate by the changes which their lenses undergo that the lens formation is directly dependent upon a contact of the optic-cup with the ectoderm, and that contact with only a portion of the optic-cup is necessary to cause the ectoderm to begin lens formation; to produce a lens the contact of the optic-cup must be durable with the ectoderm; and that the optic-vesicle may change into an optic-cup without the aid of the mechanical pressure of the lens.

E. E. B.

A CONTRIBUTION TO THE TREATMENT OF LUXATION OF THE CRYSTALLINE LENS INTO THE ANTERIOR CHAMBER.—ALBERTOTTI, G., Padova (*La Clinica Oculistica*, April, 1907). The author reports three cases. In the first case the luxation was spontaneous. After instilling eserin to contract the pupil, operation was advised and accepted. At the time of operation it was discovered that the lens had passed behind the iris. Extraction as in the regular cataract operation was proceeded with. The lens was removed in the capsule after an upward iridectomy. There was slight loss of vitreous. The eye healed without complications. V. was 5/xx.

The second case was caused by trauma. The lens passed behind the iris. There was slight iridodonesis. The lens was extracted in the capsule with Pagenstecher's spoon. A small quantity of vitreous escaped. Healing was uneventful. V. was 5/l.

The third case was also traumatic. At the time of operation the lens was in the anterior chamber and was expelled with the flow of aqueous following the corneal incision. The process of repair proceeded regularly and V. was 5/x with + 7 D. The author believes that the operative treatment is superior to attempts to return the lens to the posterior chamber by massage.

R. H. J.

SPONTANEOUS RUPTURE OF THE POSTERIOR CAPSULE OF THE LENS FOLLOWING A DOUBLE PERFORATION OF THE GLOBE BY A SPLINTER OF IRON.—HEUSS, S., Heidelberg (*Graefe's Arch.*, December, 1906, lxvi, H. i), comments upon the rarity with which the capsule of the lens is destroyed in purulent inflammations of the eye. He cites six cases in which perforation of the capsule was present, but in no one was the lesion excited by a foreign body. In all of the cases the position of the perforation of the capsule corre-

sponded with the location where the most intense purulent process had developed.

In his own case a splinter of iron of considerable size twice perforated the globe. It entered the sclera to the nasal side of the cornea, traversed the ball obliquely and became imbedded beneath the papilla. The lens was undisturbed by the course of the foreign body; nevertheless the central portion of the posterior capsule was ruptured over a great extent of its surface. The lens matter protruded through the tear and had been converted by the purulent inflammation into a globular mass which on one side closed the opening in the capsule and on the other was circumscribed from the vitreous by a delicate fibrin net. The entire area surrounding the point of entrance through the ciliary body and processes and the intact posterior capsule was free from bacteria.

Experiments show that aseptic purulent inflammation of the vitreous excited by the injection of Hg. can cause perforation of the posterior capsule and purulent inflammation of the posterior cortex.

The *modus operandi* of the rupture could be explained in the following manner: Colonization of micro-organisms in the lens capsule, which, as the result of chromatolysis, excited the production of leucocytes and through the development of connective-tissue-dissolving enzymes the capsule suffered perforation. W. Z.

ON RING-SHAPED OPACITIES ON THE ANTERIOR SURFACE OF THE LENS AFTER CONTUSIONS OF THE EYE.—KRUSIUS, F., Marburg. (From the eye clinic in the Univ. of Marburg. *Ztschr. fuer Augenheilkunde*, vii, Juni, 1907, p. 522.) Vossius first described six cases before the International Congress at Lisbon, 1906. Krusius observed a similar one in a student whose right eye was hit by a piece of a rapier flying off while he was watching dueling exercises. Krusius found erosions of the epithelium and opacities of the deeper layers of the cornea, hyphema, anterior chamber deep, iris indistinct, pupil rather wide, lens seemed as if it were crowded backwards. The next day the hyphema had almost disappeared, but the fundus was veiled through opacities of the cornea and vitreous. After a week, on illumination with the plane mirror, a slight ring-shaped opacity, of 4 mm. diameter, was seen in the region of the anterior capsule, sharply defined outside, slightly tapering inside. On oblique illumination and through the binocular loupe, it consisted of very fine, whitish gray dots on the capsule. The pupillary margin showed slight ruptures. The posterior surface of the cornea or the corneal aspect of Descemet's membrane exhibited a slight gray opacity corresponding to the center of the ring-shaped opacity

of the capsule. These were unchanged a month later and the pupillary reaction was very sluggish. In concordance with the cases of Vossius, the cornea and pupillary margin of the iris were, by the traumatism from in front, pressed against the lens, so that the epithelium of the capsule was injured along the pupillary margin. Also here the opacity became visible after dilatation of the pupil by atropin.

C. Z.

LIDS.

CASE OF SUPERNUMERARY CANALICULUS.—NANCE, WILLIS O., Chicago (*Jour. Ophth and Oto-Laryng.*, May, 1907, i, 48), reports a case of a double canaliculus of the lower lid, two distinct puncta being present, one in the normal position and the other 4 mm. nearer the inner canthus. A probe passed through each punctum into the lacrimal sac through a separate canaliculus. There was no history of any previous probing or any ocular treatment.

W. R. M.

HISTOLOGICAL STUDY OF SPRING CATARRH (TARSAL FORM).—LAFON (*Ann. d'Oculistique*, October, 1906), thinks that the solution of the problem of spring catarrh should be sought in pathological anatomy. As a result of microscopical examinations of vegetation removed from the lids, he concludes that these vegetations should be considered as a tarsopalpebral proliferation, formed by hyperplasia of normal elements, and that there is a complete histological analogy between these vegetations and certain hypertrophic lesions of the nose and pharynx; such as pharyngeal adenoid vegetations, hypertrophy of the palatine tonsils and hypertrophy of the inferior turbinal.

G. C. H.

PATHOGENY AND RADICAL CURE OF GRANULAR ENTROPION OF THE UPPER EYELID.—CANGE (*Revue Generale d'Ophthalmologie*, June 30, 1907). This paper is a lecture given by its author; an abstract of it can not do it justice, and a full translation would require too great space.

B. E. F.

MATERIA MEDICA AND THERAPEUTICS.

RECENT ADVANCES IN OCULAR THERAPEUTICS.—RYERSON, G. STIRLING, Toronto (*The Canada Lancet*, July, 1907). Not so long ago the ophthalmologist had but few drugs to rely upon to combat the special diseases of the eye. Atropin, eserine, and more recently cocaine, constituted his main support. Now, however, an array of pharmacal preparations and numerous alkaloids are at hand to aid his surgical skill. For convenience of description the author divides these therapeutic agents as follows:

1. Local anesthetics, (a) superficial, (b) deep.
2. Drugs acting specially upon the iris and ciliary muscles.
3. Drugs affecting the vascular condition of the eye.
4. Astringents and antiseptics and other general remedies in their local application.

Class 1.—Cocain, eucaïn, tropocain, holocain, stovain, alypin, dionin, acoin.

Alypin is the local superficial anesthetic par excellence. It does not cause dilation of the pupil or paralyzation of accommodation, nor has it any toxic effect.

Dionin is a powerful sedative, hypnotic and lymphagogue and is regarded as one of the most valuable additions to our eye materia medica of recent times.

Class 2.—Atropin, scopolamin, duboisin, euphthalmin, eserin, pilocarpin.

Class 3.—Adrenalin is a powerful modifier of the vascular conditions of the eye. Its greatest use is in controlling and preventing hemorrhage during operations.

Class 4.—Argyrol, protargol, alphazone, ichthargan, mercural, the sodium salts, brometone, spermine, jequirital.

The author puts argyrol in the first place in suppurative conditions of the eye. It should be used in 5 to 50 per cent. solutions, which should be freshly made.

F. A. AND P. G.

VALUE OF TUBERCULIN TR. IN OCULAR TUBERCULOSIS.—BULL. C. S., New York (*Jour. Am. Med. Assn.*, Aug. 3, 1907), points out that the ocular lesion may be primary, and the only focus of infection in the organism. Enlarged glands are found in 85 per cent. of anterior tuberculosis. The combination of cell aggregations, giant cells and caseous degeneration is diagnostic. The inoculation test is the most certain of all. The presence of tubercle bacilli is definite proof, but their absence is not. Endogenous infection of the posterior segment of the eye may occur in disseminated tuberculosis or in chronic tuberculosis of bones and skin. The development of tuberculosis of the eye through the blood is always secondary to a focus elsewhere. TR. (tuberculin recens) is produced by triturating dried cultures of tubercle bacilli, digesting the powder with distilled water, and centrifuging the solution. The final solution contains 0.1 c.cm. of solid matter to the gram. The initial dose is 0.002 mg., to be gradually increased. A rise and fall of temperature of 2° to 3°, accompanied by chilly feelings and some pain in the joints, repeated ocular injection and swelling of the tuberculous nodules, afternoon rise of temperature and slight cough in case

of bronchial or pulmonary involvement, are characteristic symptoms. It is wise to begin with the smallest possible dose and to take the temperature regularly for several days before the injections are begun. The therapeutic results of prolonged treatment in tuberculosis of the lids, conjunctiva, cornea, sclera, and iris are decidedly encouraging. It should be continued for several months.

P. H. F.

STAINING FROM ARGYROL EMPLOYED IN DISEASES OF THE CONJUNCTIVA AND LACRIMAL APPARATUS.—MOLTON, II., Fort Smith, Ark. (*Ophthalmic Record*, April, 1907). A 25 per cent. solution of argyrol was prescribed for a conjunctivitis in an elderly physician. He used it three times a day almost without interruption for nearly two years. As a result the conjunctiva was intensely stained in the characteristic way so often seen after the prolonged use of silver nitrate. The author has abandoned the use of argyrol as an injection into the lacrimal sac for dacryocystitis, because of a case of subcutaneous staining induced by the injection of a few drops of argyrol into the sac through the dilated punctum. The stain was very extreme at first, but gradually faded to a brownish discoloration, somewhat more intense, but resembling that seen below the eyes of some people.

M. B.

INDICATIONS FOR THE EMPLOYMENT OF ADRENALIN CHLORID IN CONJUNCTION WITH COCAIN IN OPERATIONS ON THE EYES.—THEOBALD, S., Baltimore (*Jour. Am. Med. Assn.*, July 27, 1907), finds adrenalin useful not only to check hemorrhage, but to increase the anesthetic action and reduce the toxicity of cocain. It is valuable in operations on the ocular muscles, the lacrimal passages and on chalazia and other tarsal cysts. In cataract extraction it may cause collapse or opacity of the cornea. In iridectomy it aids materially. In pterygium, it is contraindicated, as excessive blanching obscures the condition. In ocular hemorrhage, traumatism is checked, and the detection and removal of foreign bodies imbedded in the superficial structures of the eye is aided. Adrenalin may be sterilized by boiling for a short time without impairing its efficiency.

P. H. F.

DIONIN IN OPHTHALMIC PRACTICE.—GROSSMANN, K., Liverpool (*Am. Jour. of Ophth.*, July, 1907), reviews the former studies on the action of this drug. It acts as a powerful lymphagogue and anesthetic, but is not an analgesic. It also has marked antiseptic properties. Chemosis fails to appear in about one case in twelve. Sneezing is frequently observed immediately after instillation.

After one or two treatments, chemosis fails to appear and the drug should not be used oftener than twice a week or so (C.P. H. F.). It is particularly valuable in corneal opacities, abrasions, relapsing erosions, in episcleritis, especially the rheumatic form, and, above all, in iritis and iridocyclitis. In the latter affections it seems to aid the action of atropin. It is of value in clearing up exudates in the anterior chamber and in causing resorption of lens débris after cataract extraction, but here it is to be used with caution or at a late stage only on account of the danger to the eye from paroxysmal sneezing. In inflammatory glaucoma it is an analgesic of the first importance. In detachment the results are not decisive. The drug may be applied in aqueous solutions, 1 to 10 per cent.; ointments, 2 to 20 per cent., or finely powdered, in full strength. P. H. F.

THE SERA AND THE ORGANIC SALTS IN OCULAR THERAPEUTICS. —DARIER (*La Clinique Ophtalmologique*, June 10, 1907). This paper, a review of some of his previously published work, was read by its author at the French Ophthalmological Society in May, 1907. It is stated that antiseptics, since Lister, play a most important rôle, and that their number is legion. It is from antiseptics, from prophylaxis and from vaccination against infections that Jenner, Pasteur, Behring and Roux, that we have had opened to us a new field in ophthalmology. The work of Roux has shown the good effect of serotherapy in infective corneal ulcers; that of Hippel has demonstrated cures by the tuberculin of Koch; finally Credé, Wetter and others have arrested infectious processes by the intravenous injections of colloidal silver, by which latter Frousseau, Leboutre, Bandoïn and Darier have obtained similar success in ophthalmology. In 1899 Darier cured a case of diphtheritic corneal infiltration with injections of the serum of Roux; since then he has not hesitated to give these injections. Shortly after Roemer published his first cases of infective corneal ulcer treated by antipneumococcus serum, Darier treated three similar cases with antidiphtheritic serum successfully, not being able at that time to procure that of Roemer. Later, however, Darier was able to obtain it, and the results of the effect of the two sera in the cases were identical.

Darier has also used serumtherapy with success in the case of a woman of 72, who after a correct cataract extraction had a corneal infection.

B. E. F.

PYOKTANIN IN THE TREATMENT OF AFFECTIONS OF THE EYE. —WICHERKIEURICZ (*Wiener Medizinische Wochenschrift*, May 11, 1907). This drug was first recommended in cases of purulent affections of the cornea. The effect of the drug is enhanced by the

simultaneous use of dionin. This form of treatment was very efficacious in cases of infected corneal ulcers, in purulent dacryocystitis, in phlegmon of the orbit and in empyema of the accessory sinuses.

J. G.

EXPERIMENTAL INVESTIGATIONS WITH COCAIN, HOLOCAIN, BENCAIN, TROPACOCAIN, ACOIN AND ALYPIN AS REGARDS THEIR INJURIOUS EFFECTS UPON THE TISSUES.—REICHMUTH (*Wiener Medizinische Wochenschrift*, May 11, 1907). Three methods were used in the experiments:

1. Instillation into the eye of man and animal.
2. Injection into the conjunctiva.
3. Washing out of the anterior chamber.

Of all these drugs, cocain proved to be the least injurious one to the tissues; it was found to be the least irritating, whereas acoin and holocain produce severe necrotic changes in the eyes of the rabbit.

J. G.

THE VALUE OF X-RAYS IN OCULAR THERAPEUTICS.—RING, G. O., Philadelphia (*Jour. Am. Med. Assn.*, Sept. 29, 1906), says that this treatment may be relied upon to effect a cure in superficial epithelioma and rodent ulcer of the lids. If unsuccessful, electrochemical sterilization or, finally, excision with or without plastic operation may be utilized. In orbital carcinoma, it is of value, but the less so the deeper the growth. In sarcoma of the lids and orbits, a number of cures have been reported. Pain is generally relieved, but in exceptional cases increased. In trachoma it should be used if ordinary methods fail, and it seems to be of positive benefit in vernal conjunctivitis. Among the other conditions which have been benefited are chronic conjunctivitis, scleritis, episcleritis, traumatic uveitis, conjunctival tuberculosis, corneal ulceration, glioma, and gummata. It may cure malignant disease involving the cornea and conjunctiva if applied sufficiently early, and is effective in congenital nevi. The results in glaucoma and painful iridocyclitis are doubtful.

P. H. F.

SEROTHERAPY IN DIPHTHERITIC PARALYSIS OF THE ACCOMMODATION.—AUBINEAU (*Ann. d'Oculistique*, September, 1906), suggests that the visual troubles that follow diphtheritic angina may be due to the proximity of the superior cervical ganglion. Diphtheritic paralysis of the accommodation is characterized by the integrity of the iris muscle. The facts that it tends to recur spontaneously and is of variable duration make the appreciation of therapeutic results difficult, and opinions are contradictory as to the

efficacy of the serum treatment. Aubineau reports a case in which the effect was so direct and evident as to leave no room for doubt. He urges the use of large doses. G. C. H.

SALICYLAS ZINCI IN THE TREATMENT OF ULCUS CUM HYPOPIO.—NICOLAI (*Tydschr. v. Gen.*, Aug. 11, 1906), trying to find out the sensibility of different bacteria for salicylas zinci, found the *Diplococcus pneumoniae* quite sensitive; he, therefore, used it for ulcera cum hypopio with success. Nicolai had lately eight cases, five of which with affection of the lacrimal ducts, of which in four the *Diplococcus pneumoniae* was present. The corneal epithelium was in most cases nearly destroyed, and the anterior chamber contained pus. All cases were treated with a 2 per cent. solution of salicylas zinci every two hours, taking good care to reach the ulcer; the lacrimal canal was syringed once a day. The pus secretion directly diminished, so that in no case the hypopion increased and necessitated paracentesis. E. E. B.

SUBCONJUNCTIVAL INJECTIONS OF AIR IN OCULAR THERAPEUTICS.—TERSON and G. TERSON (*Annales d'Oculistique*, February, 1907), give the result of experimentation with subconjunctival injections of sterilized air in the various affections of the anterior segment of the eye. The method of treatment was introduced in 1901 by Koster, who injected air into the anterior chamber and under the conjunctiva in tubercular affections of the iris and conjunctiva, and Chesman made subconjunctival injections of air in the treatment of a form of sclerosing keratitis, probably tuberculous.

The authors, impressed with the happy results of insufflation of air in sciatica and various neuralgias by Cordier and other clinicians, resolved to use the subconjunctival injections of air in cases of corneal lesions accompanied by photophobia and pain. They report cases of successful treatment by this method of marginal corneal ulcers, traumatic and non-traumatic, and with and without hypopion, of sclerosing keratitis complicated with episcleritis and iritis, and one case of infection of the wound after cataract extraction.

A cubic centimeter of air, sterilized by drawing it through the hollow needle which had been heated to redness in an alcohol flame, was injected beneath the conjunctiva with a syringe. The interval between the injections varied from three to five or six days. The complete absorption of the air requires from three to eight days.

As to the way in which this injection of air influences the various lesions of the anterior segment of the eye, several hypotheses may be

suggested. It may be simply antiseptic as in the case of tubercular peritonitis. It may act by irritation exciting regeneration of tissue by a flow of fluids in the lymphatics, like injection of solutions of bichlorid of salt. In most of the lesions of the anterior segment of the eye, where numerous filaments of the ciliary nerves are involved, photophobia and pain are prominent symptoms and are promptly relieved by injections of air which may act by distension of the tissues and consequent stretching of the fine nervous ramifications.

The authors conclude that subconjunctival injections of air, almost painless and entirely harmless, have an **elective action upon** the photophobia and the affections of the anterior segment of the eye; that they hasten the evolution of ulcers of the cornea, particularly of marginal ulcers; that they are of unquestionable efficacy in phlyctenular keratitis and in the sclerosing keratitis of young subjects, and are equal in effect to subconjunctival injections of sublimate in sclero-episcleritis of older subjects, and that they have several times, in their hands, caused the disappearance of the hypopion of an iritis either with or without a wound of the cornea.

G. C. H.

X-RAY AND SOME PERSONAL OBSERVATIONS OF ITS USE IN DISEASES OF THE EYE.—COLEMAN, W. FRANKLIN, Chicago (*Jour. Ophth. and Oto-Laryng.*, July, 1907, i, 125), urges the more general use of the *x*-ray in certain classes of eye diseases, and believes that, with the proper use of the *x*-ray, any serious injury should very rarely occur. He discusses the nature and means of producing Roentgen rays, their action on normal and abnormal tissues, dosage, effects of radiation, etc. The author gives some illustrative cases showing the beneficial effects of the rays in trachoma, episcleritis, relapsing keratitis and opacity of the cornea and orbital cellulitis.

W. R. M.

PASSIVE CONGESTION IN OPHTHALMOLOGY.—HESSE, ROBERT (From the eye clinic of Professor Dimmer in the Univ. of Graz. *Centrbl. fuer Augenheilkunde*, May, 1907, p. 133). Since his first communication a year ago (*Centrbl.*, June, 1906, reviewed in OPHTHALMOLOGY), Hesse continued to treat all cases of serpent ulcer of the cornea, without exception, even the most severe ones, with suction by means of the glass cups, previously described, applied over the opened lids, twice daily for 10 to 30 minutes, with short intermissions after each 10 minutes. The application was not painful and it relieved the frequently violent pain at once. Only in 3 cases out of the 23, the clinical histories of which are reported in detail, the treatment failed. These 3 were complicated by dacryo-

cysto-blennorrhœa, from which reinfections took place. In such cases conservative treatment must be abandoned and the tear sac must be extirpated. In the remaining 18 cases the effect of suction was favorable. The average duration was about 11 days. All other medication was excluded, except atropin twice daily. The resulting scars were very clean and thin, interfering less with vision. Hesse recommends passive congestion by suction in connection with the well-known methods of treatment. C. Z.

THE TREATMENT OF HAY FEVER.—KOSHER (*Wiener Medizinische Wochenschrift*, May 11, 1907). The author is of the opinion that hay fever is only an exacerbation of a previously existing chronic catarrh of the respiratory tract and of the conjunctiva. The pollen of grain is the exciting cause of the attacks.

As a rule, these patients have been suffering previously from a dry catarrh with or without subjective symptoms. The eyelids are dry, there is photophobia and lacrimation in cold and windy weather; in the nose there is a sensation of dryness and an unpleasant dry feeling in the nasopharynx in the morning, as well as a greater tendency to sneezing in a dusty atmosphere. The most important symptom in these cases, according to the author, is a diminution of the normal secretion of the mucous membrane.

If a healthy individual comes in contact with the pollen, the secretions of the mucous membrane will be increased and will surround or rather cover the pollen, and thus protect the blood vessels and nerves against the irritating effect of the same; whereas, in an individual with a tendency to hay fever, who has a dry catarrh of the mucous membranes, the secretion of mucus is diminished and the pollen produces a more injurious effect.

The treatment, accordingly, should consist in the re-establishment of the normal secretion of the mucous membrane, and this may be best accomplished with the use of a 30 per cent. of chlorate of potassium. J. G.

USE OF ADRENALIN DURING ETHER ANESTHESIA.—VENABLE, CHARLES S., Charlottesville, Va. (*Virginia Medical Semi-Monthly*, Feb. 22, 1907). The writer used adrenalin during ether anesthesia in eighteen cases. These cases were not selected and recovery from the anesthetic was uniformly good. He states: "I found 25 per cent. aqueous solution of the standard 1 in 1000 gave the best results, and that by first pouring ether in the towel cone and spraying the adrenalin solution on it, depending on the ether to vaporize it sufficiently for inhalation, was the best mode of administration. Three to six minute intervals are sufficient for its use and a total

of from one-half to one ounce of this solution is enough for an operation lasting from thirty minutes to an hour. The effects are a more uniform etherization, the pulse becoming steadier, respirations are quiet and regular, the bronchial secretions are practically checked, and the progress of the operation is not interrupted.

"From the foregoing facts I conclude that, owing to the contraction of the smaller vessels, the bronchial glands secrete less mucus, and there is better aëration in the bronchioles and pulmonary vesicles, less ether is required to produce anesthesia and there is less probability of ether pneumonia followin. The adrenalin, acting generally from absorption, is a powerful stimulant; it materially lessens shock, lessens the capillary ooze at the field of operation, and is of great benefit to the much weakened patient."

H. V. W. AND S. G. H.

MEDICOLEGAL.

MEDICOLEGAL ASPECTS OF OCULAR INJURIES.—FRIDENBERG, P., New York (*Am. Jour. of Surgery*, June, 1907), refers to the economic value of acute vision and the fact that the complex formulæ used in estimating loss of earning power are not of much practical use in damage suits. The amounts awarded by juries in similar cases and the average compensation paid by accident insurance companies, on the other hand, have been subjected to practical test and represent a survival of the fittest under competition. These figures are matters of common knowledge of which a court may take cognizance and require no special demonstration. The loss of actual visual power is only one item of debit. The reduction of the margin of safety, the increased danger of actual and possible injury to a single remaining eye, the cosmetic disadvantage and handicap in industrial competition, the loss of the binocular field of vision, must all be considered. Careful and complete examination should be made and vision tested in every case of ocular injury which may become a basis of litigation. Simulation and aggravation should be guarded against. A combination of simple tests may be successful where one fails. Objective signs alone, particularly the pupillary reaction, may be of great importance. In injuries to the optic nerve without intraocular changes, the sudden, permanent character of the blindness, absence of fundus changes and characteristic pupillary reaction (loss of direct recontraction with preservation of consensual light reflex and accommodative reflex) establish the diagnosis beyond doubt. The signs of optic atrophy may not develop until a later date.

P. H. F.

LOSS OF EARNING ABILITY FROM ABSENCE OF ONE EYE.—LANS, L. J. (*Tydschr. v. Gen.*, Aug. 18, 1906), received fifty useful answers about this question. He comes to the following conclusions:

1. The damage to the monocular workman in a trade, which does not demand high claims from the visual ability, should not be higher than 25 per cent.

2. Is the trade one of those which puts high claims to the visual ability, then the damage should be at least 30 per cent.

3. This damage should be considered provisionally, and after two to three years, after repeated examinations, a definite annuity should be given.

4. The percentages named under 1 and 2 can be changed under particular conditions: (a) On account of age; (b) on account of deformities; (c) on account of photophobia, inflammation of the other eye; (d) on account of absence of stereoscopic vision, which is necessary for the trade; (e) on account of poor visual acuity of the remaining eye.

Obligatory examination of the eyes with the definitive appointment of the workmen, Lans considers to be to the advantage of the work-giver as well as of the workman and will put the damage on a surer footing in case of accident.

E. E. B.

MISCELLANEOUS.

EYES OF WHITE AND BLACK PUPILS IN MEMPHIS PUBLIC SCHOOLS.—MINOR, J. L., Memphis (*Jour. Am. Med. Assn.*, Aug. 3, 1907), notes the absence of myopia in negro children exposed to the same sanitary and occupational conditions as their white school-mates. The predisposing factor wanting is the long line of educated ancestry. Their average of perfect vision was two and a half times as great as in the whites. Of the whites 1 in 6, of the negroes 1 in 15, saw badly. The highest percentages of myopia and poor vision were found, as was expected, in the most overcrowded, poorly ventilated, and badly lighted school building.

P. H. F.

THE RESULT OF THE EXAMINATION OF THE EYE, EAR, NOSE AND THROAT OF THE CHILDREN IN THE PUBLIC SCHOOLS OF SPRINGFIELD, OHIO.—MINOR, C. L. (*Ohio State Medical Journal*, July 15, 1907). The examinations were made in the cloak rooms attached to each room, and consisted of tests for distance with Snellen letters and the same for near-by. For those having defective visions shown by the test, the shadow test was used to determine whether the refractive error was that of myopia or hyper-

metropia, but no attempt was made to correct the errors by retinoscopy, and an ophthalmoscopic examination was not made in every case. Dr. Minor does not find the same results as those of the German authors who report myopia enormously on the increase, but found no increase from the second grade to the time of graduation, it remaining practically the same, $5\frac{2}{3}$ per cent. The percentage of hypermetropia was $12\frac{1}{3}$. While the author believes that it is far better to have the teachers make the examination, as has been suggested, than to have none made, yet from the strong probability of many things being overlooked by them, as he points out, he thinks the examination should, whenever possible, be conducted by medical men.

M. D. S.

PREMIUMS PAID TO EXPERIENCE.—ROGER, F. and VAN BENSCHOTEN, G., Providence (*Jour. Am. Med. Assn.*, July 20, 1907), under this obscure title, report a critical study of 5,000 cases of eye disease. Of these, 67 per cent. sought or needed correction for ametropia. The desideratum here is the comfort of the patient and the relief of asthenopia with the maximum of vision. Hyperopes may require full or only partial correction. The axis of astigmatism may not be the same for distance and near work. Presbyopic correction has varying limits and no hard and fast rules. The personal equation of examiner and patient and individual opinion as to the patient's actual need are the factors which are responsible for variations in correction of ametropia by different oculists. A cycloplegic is a necessity; the gelatin discs most convenient. In two cases, chalazion caused a decided decrease in vision and change in the axis of astigmatism. The "fogging" system is valuable in determining the latent error by overcorrection, but aggravates rather than relieves the asthenopic symptoms. Full correction is valuable in myopia. Non-surgical measures will effect a cure in those cases of convergent squint in which the vision of the amblyopic eye is materially improved by glasses, and in alternant squint with equal vision, becoming less under atropin. Silver nitrate is better than any of the organic compounds. Protargol causes argyrosis. Argyrol is ineffectual. Dionin is of great value in clearing up trachomatous pannus, especially when applied in powder form and followed by cupric sulphate or bichlorid. The results are remarkable and uniform. The cornea clears in a way never before experienced. Pyoktanin (yellow), a drug much used formerly, but practically abandoned of late, was found very efficacious in $\frac{1}{2}$ to 1 per cent. solutions in corneal ulcer, relieving pain and hastening the healing process. In infection following extraction and in sclerosing

keratitis in combination with dionin and atropin, it was found very valuable. In maculæ of recent origin, subconjunctival injection of salt solution and powdered dionin yielded brilliant results in a few cases. In scleritis, rheumatism was a factor in almost every case, but treatment devoted to the lithemic condition was unsatisfactory. In two cases of dental disease, there was hemorrhagic retinitis, with vitreous exudate and occlusion of the upper temporal branch of the central retinal artery in one. This cleared up spontaneously and good sight was restored. In the other, pus, due to infected foreign body, was found in a crowned cavity. There were 13 cases of retinal detachment, 9 recent. In only one was there permanent cure, following the passing of a Graefe knife through the most dependent portion of the detachment. The routine treatment consisted in rest in the recumbent position and pressure bandages, pilocarpin as a collyrium and by hypodermic injection, scleral puncture, subconjunctival salt injections and intraocular injection. In one case of embolism of a branch of the central retinal artery, with immediate treatment by deep massage every few hours and large doses of pilocarpin, the circulation was suddenly reëstablished and almost full vision at once restored one day after the accident. The discussion brought out a recommendation of atropin as a cycloplegic, fermented milk diet in gastrointestinal toxemia causing asthenopia, and the change of refraction after wearing partial correction.

P. H. F.

PROGNOSIS IN DEEP-SEATED DISEASES OF THE EYE.—DEMETS (*La Clinique Ophtalmologique*, June 25, 1907). The object of this paper is to show the need of care in prognosis in cases which at first sight would seem to be hopeless, but which may upon further investigation as to cause prove amenable to treatment. Three cases are reported: The first, a chloro-anemic young woman who had been pronounced incurably blind from optic nerve atrophy following meningitis. Demets found an intestinal toxemia which was relieved by purgatives and the blindness removed. The second case was that of a lapidary, 35 years old, who had asthenopia, insomnia, headache and visual troubles; general nutrition defective; there had been a sudden loss of vision, papillary edema and a fatal prognosis given by Snellen. When Demets first saw the case there was light perception, and he prescribed injections of enesol with calomel twice a week; in fifteen days patient gained rapidly and cure followed. The third case was a rheumatic woman, 69 years of age; she became blind in right eye in 1904 from what a confrère pronounced to be embolism of the central artery of the retina.

On Feb. 12, 1906, the left eye became blind; ophthalmoscopic examination gave atrophy of right optic nerve and embolism of left central retinal artery. Subconjunctival injections of cyanid of mercury twice a week until end of June for both eyes resulted in a month with 4/iv vision in the left eye and 1/x in right.

B. E. F.

REPORT OF THE MEETING OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM, Edinburgh, May 25, 1907 (*Brit. Med. Jour.*, June 12, 1907). The President, Mr. Priestley Smith, in the Chair. Coats gave a lantern demonstration of the pathology of rupture of Descemet's membrane, first discovered microscopically in 1875 by Becker. Coats found them in most cases of buphthalmus and in a few of glioma with increased tension. The ruptured ends were sometimes found to be flat, sometimes curled up, but the rupture itself was almost always covered with endothelium. At times, extensive detachment of the membrane was found. Experimentally he found that the globe generally gave way before the membrane, but if the latter was first scratched many fractures of the rupture could be produced.

Edridge-Green gave an account of physiological variations in color perception determined with Rayleigh's color-mixer. Bruce gave a lantern demonstration of the third nerve nucleus. Sydney Stephenson detailed experimental inoculation of syphilitic material into the eyes of monkeys and rabbits producing interstitial keratitis in which the *Spirochæte pallida* was then found.

Leslie Buchanan showed lantern slides of the eyes of invertebrates indicating that the degree of functional activity of which the species is capable can be inferred from the anatomical structure. Eyes of the octopus, clam, spider, caterpillar, house fly, bee and snail, were demonstrated. The eye of the leech and mole showed that loss of functional activity was followed by anatomical degeneration. Buchanan demonstrated a case of rupture of the pectinate ligament, with displacement of the iris and ciliary body backwards. McGillivray discussed the treatment of after-cataract. To avoid dragging on the ciliary body and the risk of cyclitis, he divides the capsule diagonally by very short and steady sawing motions with a special cutting needle. He does not hesitate to divide a capsule when there is vision less, from this cause, than 6/xii (!). Sinclair and Shennen reported a case of Parinaud's conjunctivitis in a laborer, aged 61. Two varieties of staphylococci were found. Pollock described a case of telangiectasis of the retinal capillaries and venous radicles, following fracture of the left side of the skull.

Sinclair showed a collapsible apparatus for testing the field of vision. Bramwell exhibited a brain showing occipital abscess from a case in which epileptic fits were preceded by visual aura, and in which hemichromatopsia developed. Also a case of ocular palsy with congenital absence of cranial nerve nuclei. Berry exhibited a loupe for myopes and test objects for illiterates. Sym showed a case of complete congenital anophthalmus. Paterson showed a case of tubercle of the conjunctiva and one of reticular keratitis. Maitland Ramsay exhibited an opaque projector for demonstration purposes. Lieut.-Col. Herbert gave a lantern demonstration of the sinuous lid border as a sign of trachoma. P. H. F.

SAVAGE EYESIGHT.—SUPER, DR. C. W. (*Scientific American*, July 13, 1907), in the *Popular Science Monthly*, says that the belief held by many people that savages have more acute eyesight than civilized man is an error. They only have their eyes trained to see things that are necessary to their preservation, game and enemies. The white man living among the Indies acquired also, not only the power to discern objects readily, but also to interpret their signification as did the Indians. It is probable that not only the Indians, as well as all tribes living on the same social level, but also the backwoodsmen, retain their sight to a more advanced age than is now generally the case; but that the eye of the former was naturally more powerful than that of the present generation or that of men in general is unsupported by trustworthy evidence. It is well known that what are sometimes called the lower senses—touch, taste and smell—are often of extraordinary acuteness in civilized man as the result of training. If, therefore, any of the senses of our urban population are feebler than those of the dwellers in the rural districts, it is not due to inherent weakness, but to improper or injudicious use. M. D. S.

ILLUMINATION AS AFFECTING THE EYE.—REBER, WENDELL (*Scientific American Supplement*, May 4, 1907), says that every one does three times the work in 16 or 17 hours that people did 100 years ago. Twenty-five years ago the Germans were prompted to go into the matter of lighting public buildings, schools, etc., because their generation was rapidly becoming near-sighted. Japan is pushing them hard for that honor. With the Germans the cause is found in three things: abominable type, insufficient illumination, and poor hygienic conditions. They went at their schools and applied their principles in the right way, and every German scientific publication of to-day is published in the Gothic type, and they are trying very hard to use it in their text-books. It is evident that we

are developing a large proportion of near-sighted young people in our schools, and the ratio of those who are far-sighted is much lower than it ought to be. Every school house ought to be constructed to get the greatest amount of light consistent with the safety of the building. For the minimum amount of light there should be not more than five square feet of floor space for each square foot of glass. The German government intends creating a commission of architects or engineers to decide how the lighting of schools shall be carried out, and this question will receive attention as schools are built.

M. D. S.

OPHTHALMIC MIGRAINE AND PERIODIC PARALYSIS OF THE THIRD NERVE.—PADERSTEIN. *Berlin (Deutsche Medizinische Wochschr., 1907, No. 19, p. 762)*. A girl, aged 14, suffered, since early childhood, from attacks of left-sided migraine, with nausea, vomiting and dizziness. They occurred suddenly, sometimes during the night, at intervals of days or weeks, and lasted 1, 3, 4, 7 days. After such a seizure, six weeks ago, the left upper lid was drooping for two days. A week ago the ptosis was complete; it had come on the third day of the attack, when the pain in the left side of the forehead had subsided. There was also herpes labialis, and the patient stated that each time when she had pain she also had blisters on lips and tongue. The parents and the other children had no such affections. A week after the first examination the ptosis had subsided. Within the next two years the migraine was sometimes associated with ptosis, sometimes not. Then a paresis of the sphincter and finally of the whole third nerve was observed, which disappeared after a few days, with total recovery of the patient. The case corresponded with Charcot's "ophthalmoplegic migraine."

C. Z.

PROTEST AGAINST THE EMPLOYMENT OF PARAFFIN INJECTIONS NEAR THE EYES.—DAVIS, A. E., New York (*Jour. Am. Med. Assn., July 20, 1907*), refers to the occurrence of retinal and pulmonary embolism after paraffin injection for nasal deformity, and reports two cases of more unusual accidents. In one, paraffin was injected into the nose and escaped into the tissues of the upper lid, forming solid masses in the lid and brow with marked ptosis. Complete recovery and cosmetic cure followed exsection of the masses. In the second case, a solid ball of paraffin inserted into the capsule of Tenon for ocular prosthesis after enucleation escaped into the apex of the orbit—a most unusual accident—pressed on the optic nerve and caused sympathetic irritation, which promptly subsided after the mass was removed. The keratosis of the skin produced

by injection of paraffin, and the histologic changes resulting, bear a strong resemblance to malignancy. Long-continued irritation seems to have a tendency to cause epitheliomata as observed by Kirk in workmen engaged in refining paraffin. Sloughing of the tissues, due to injection of too much paraffin or injection into scar tissue, has also been reported. As sight may be destroyed and even life sacrificed, paraffin should not be injected to correct slight deformities or make a patient comfortable. Discussion: Faulty technique is responsible for most accidents. Paraffin of high melting point should be used, iced cloths placed over the root of the nose and pressure made on either side of it. (Mules' operation, whether with glass balls, metal spheres, or paraffin, is unnecessary and dangerous. In the few cases in which there is any difficulty with the solid back or "reform" artificial eye of Snellen, a small glass sphere may be cemented to the back of the prothesis and will accomplish without danger all that one could expect from the introduction of a foreign body into Tenon's capsule. P. H. F.). Surgical cleanliness is essential. The injection should be beneath, not in, the skin, and be done slowly. They are contraindicated in luetic subjects. In about half the cases of introduction of paraffin into the orbit, the mass is extruded later on.

P. H. F.

A CASE OF BILATERAL METASTATIC OPHTHALMITIS IN PUERPERAL PYEMIA; RECOVERY OF THE PATIENT.—DE SCHWEINITZ, G. E., Philadelphia (*Ann. of Ophthalmology*, January, 1907). The mortality of bilateral puerperal metastatic ophthalmitis reaches, according to Axenfeld, 85 per cent. The interesting features of this case presented by the author are a puerperal septicemia, followed within four days after its appearance by an annular abscess of each cornea and later by panophthalmitis. In all probability the focus of infection in this case was an abrasion in the uterine mucous membrane, and the bacteria were transmitted to the anterior portion of the uveal tract, where they set up an iridocyclitis, followed by a keratitis which attacked the cornea from behind, and thus there came about the ring infiltration which was evident by inspection. Owing to an emigration of leucocytes from the periphery, there was subsequently a general infection, as is almost always the case, of the coats of the eye, or, in other words, an ophthalmitis. Although so-called peripheral annular infiltration or ring abscess of the cornea usually result from perforating injuries or operations, it may also occur, according to Parsons, after spontaneous perforation of an ulcer and in metastatic ophthalmitis. The recovery of this patient from a severe puerperal pyemia, associated with bilateral

metastatic ophthalmitis and abscess formation in the arm and rectal space, presents a result which is unusual. M. B.

FIRST CASE OBSERVED IN MEXICO OF AN EXOTIC DISEASE CALLED "GOUNDOU" OR "ANAKHRE."—DR. FERNANDO LOPEZ, Mexico (*Anales de Oftalmologia*, January, 1905). In October, 1904, he observed a lady, 36 years old, with a regular constitution, who had two symmetrical tumors on each side of her nose, ovoid in form, with a large oblique axis downwards and outwards, and placed on the ascending apophysis of the upper maxillar, the unguis, the internal part of the lower orbital border and the cheek-bone. The size of the tumors impeded downward vision and disfigured the patient. There was no alteration in the throat, nasal fossæ and tear ducts. The consistency of the tumors was like that of bone, the surface smooth, and without alteration in the skin. At 16 years of age the tumors began; they went on increasing slowly without molesting the patient, and had reached the size of half a hen egg.

This disease, peculiar to the western coast of Africa, is described in the paper on "Exotic Pathology," by Dr. Dantee, but there were no data for pathological anatomy.

The author operated on his patient, making an incision on the side of the nose surrounding the tumor, stripped the region with his trepan, taking off periosteum and soft tissues and laying open a purely bony tumor. With cutting spoon pincers, by biting the tumor, he took out the fragments as far as he deemed prudent, without finding any cavity in the interior. He sewed the skin and the healing was effected at the first intent.

His case is the second in which the extirpation of these tumors has been accomplished; for the first intervention was effected in Brazil on a mulatto, 24 years old, by Pacheco Mendez.

J. DE J. G.

THE PROBLEM OF ILLUMINATION.—HART, JOSEPH H. (*Cassier's Magazine*, June, 1907). The writer discusses the theory of light production by means of transverse waves in the ether and says that, while light may be produced by almost any form of energy, from a practical point of view, heat is the only form that need be considered in producing light. A molecule acquires kinetic energy from heat. This energy is seldom sufficient to produce a rapid enough motion to, in turn, produce short enough waves to be visible. It is generally by the impact of these molecules with one another, or that extra rapid motions are set up, which produce light waves. Now, the problem in lighting consists in the ability to select suitable molecules, having suitable structure, that they will vibrate readily

for the peculiar wave lengths which are visible to the eye, and are recognized as light, and in the production of motion in these molecules so as to get a certain proportionate amount of energy into this peculiar form. It can be readily seen that this problem is at its inception and only a fragment of the amount of knowledge necessary for the work in this field has been obtained, although the number of investigators is very great.

The problem of light production is essentially different from that of illumination. Illumination has to do with the nature of the eye and its various purposes and with the utilization of light, and is almost as complicated a problem as the preceding one, and very little more is known in this field. Thus we have light of various colors. The different colors of light are due to different wave lengths in the ether. Various wave lengths combined give new colors in proportionate amount, depending upon the different magnitudes of the waves of various lengths. The forms of light, e. g., violet, ultra violet, white, produced by different wave lengths, are discussed. No artificial light possesses the illuminating effect, or produces the same effect on the eye of the individual, that sunlight does. For reading close print, one kind of wave length is peculiarly fitted, or a certain conglomerate combination of waves may be more suitable. But in all the wide range of data for illumination no artificial light compares in every respect with sunlight. Thus the problem divides itself into the purposes for which light is used and its possible adaptation in this field, with a possibly greater theoretical range than can be obtained with sunlight. The consideration of the duty that the light must do is of prime importance in its production.

Photometers, as a measure of illuminating power, are a considerable disappointment, owing to the fact that they are general in their utilization and are not special in their application to certain duties performed by the lights themselves. The comparison of two lights of radically different colors, if the colors are pronounced, is practically worthless as a standard for illuminating purposes when made with any type of photometer whatever. M. D. S.

TRAIN SIGNALS AND PSYCHOLOGY.—(*The Literary Digest*, May 25, 1907). *The Railway and Engineering Review* (Chicago, May 4) contains in an editorial an abstract of an article by Prof. George M. Stratton, of Johns Hopkins University, on "The Psychological Need of Revising the Signals." The professor regards simplicity and uniformity of day and night signals of prime importance. The signal should pierce the mind, should thrust its meaning home, in

the most direct and unerring way. He explains that a white light seen through smoke looks reddish, and as a result engineers become distrustful of colored lights in general and take liberties with genuine red lights. No account is taken of practice where white signal lights are not used. Moreover, some men are color-blind and others are weak in their color sense, and many there be of the latter class who can pass the color test. Color can not be distinguished when seen through the corner of the eye, and even in the quiet of the psychological laboratory red and green are deceiving unless looked at squarely; and a quick glance at an object is not trustworthy, for the attention may make a full sweep to the goal, but the eye lag far behind. And, again, eyes grown accustomed to darkness do not readily detect colors; the owl-sight of the human eye is blind to the hue of things; the eye adapted to the dark can see the light, but see no color in it. The use of blades in the daylight and lights at night, and a variety of colored lights at that, is, therefore, only confusion compounded and results only in needless labor to the memory.

The professor would substitute for colored lights at night the old idea of the illuminated semaphore, or "fiery arm," as he calls it, using preferably white light. He discusses the use of oil, gas and electricity for this purpose, but considers the latter most satisfactory. The reviewer of Professor Stratton's article rather resents the intrusion of a psychologist into problems of railway practice, although he acknowledges that "the mind and its phenomena should have much to do with the proper use and observance of signals."

M. D. S.

This observation shows that salt solutions may induce certain EYE IN THE FISH EMBRYO BY MEANS OF SEA WATER SOLUTIONS OF MAGNESIUM CHLORID.—STOCKARD, CHARLES R. (*Arch. f. Entwicklungsmechanik der Organismen*, 1907, xxiii, 2), studying the influence of salt solutions on the development of fundulus heteroclitus, found that one-eyed monsters could be produced if the eggs were subjected to the action of $MgCl_2$ in sea water. In the $1/3$ m. sea water solutions of $MgCl_2$ one-eyed embryos occurred with surprising regularity in 50 per cent. of the eggs. This experiment was repeated several times, and each time it so happened that exactly one-half of the embryos had one large eye lying in an almost antero-medial position. The remaining embryos were apparently normal, so far as the eye structure was concerned.

This observation shows that salt solutions may induce certain

effects through their chemical action rather than by the osmotic pressure which they exert.

The abnormal one-eyed condition artificially produced in the fish can readily be compared with the peculiar human monstrosities known as Cyclops, Cyclopia or Synophthalmia, which are born with a single median eye, which has resulted from the more or less complete fusion of the two eyes. In such cases the nose is usually also abnormal and lies above the eye.

Sections showed the one-eyed condition to result from the union or fusion of the anlagen of the two eyes. Cases were observed which showed various degrees in this fusion; it appeared as though the optic vesicles were formed too far forward and ventral, so that their antero-ventro-median surfaces fused. This produces one large optic cup which in all cases gives more or less evidence of its double nature.

The single lens and its size is interesting in the light of Lewis' experiments on the development of the lens of the tadpole. He found that various portions of the ectoderm, if brought into contact with the optic cup, would respond by producing a lens. In these fish the lens arises from a part of the ectoderm that is different in position from the normal lens-forming area. Lewis and Spemann showed that there is no strict lens-forming area in the ectoderm of the amphibians. Stockard is inclined to believe that the same is true of the fish. Of especial interest in this connection is the size of the lens. Since the usually large optic cup influences a large ectodermal area, an unusually large lens results, and further the fused optic cups exert but a single stimulus and only one lens is formed. The size of the lens depends upon the size of the optic cup, or, more exactly, upon the extent of the ectodermal area influenced by it to form a lens.

In one out of the ten embryos that were sectioned, the lens was found to show a double structure. Here the lens was composed of two series of concentric layers. The other portions of the eye were more distinctly double than was usually the case. This serves to illustrate the last step in the fusion of the two eyes; further fusion would give a single eye.

The nasal pits in all of these one-eyed embryos were closely approximated in the median line, and were anterior to the eye instead of in the immediate eye region where they are situated normally.

Spemann artificially produced Cyclopia, using eggs of Triton when in the two-cell stage and some later stages; they were constricted about the circumference of the first cleavage plane by means of a constricting thread. When the eggs were subjected to a certain

amount of constriction, two-headed monsters resulted of the type known as *Janus parasiticus asymmetros*. One of the heads was normal with two normal eyes and two nasal pits, while the other showed various abnormalities and possessed a Cyclopean eye and a single olfactory pit. All degrees in the extent of fusion of the eyes were obtained from two approximated cups, each with its own lens to a complete fusion, giving an almost simple cup and a single lens. The single olfactory capsule occurred above the median eye. A single opticus was found in many of these Triton Cyclopean monsters. In some instances when the optic vesicle formed the cup it became so constricted at the stalk that it pinched entirely away from the brain; in such cases the opticus was wanting. According to Spemann, the double eye is formed from an anlage which is compound, representing the two optic anlagen fused together rather than from two optic vesicles which have fused after their formation. The eye stalk and nerve do not spring from both sides of the between-brain, but from its middle line. For the fish this conception is correct in part only. Here there are cases in which two distinct optic nerves pass into a fused optic cup; others show an almost complete union of the parts and only one opticus can be distinguished; others again show two optic cups so closely approximated as to incite the formation of only a single lens. It thus seems probable that in the formation of the Cyclopean eye the fusion of the two components may take place at different periods within a certain limit, though usually after the anlage of each eye has become differentiated from the brain.

The experiments were conducted in the Marine Biological Laboratory at Woods Hole, Mass.

E. E. B.

DIVERGENT STRABISMUS AND ITS TREATMENT BY WEBSTER FOX'S OPERATION.—HAMILTON, T. K., Adelaide, So. Australia (*Ophthalmoscope*, May, 1907). The author has found in the Fox operation one that especially meets the requirements for divergent strabismus. He refers the reader to Fox's text-book for a description of the technique. He reports the results of the operation on seven cases, all of which were satisfactory.

M. B.

ON A CASE OF EXTREME HYPERPHORIA.—THOMSON, ERNEST, Glasgow (*The Ophthalmoscope*, May, 1907). A girl of 20 years came under the author's observation in 1896 complaining of severe pain in the head and eyes. A diagnosis of left hyperphoria was made of from 3 to 10°. She was placed in a ward of a general hospital and received general treatment for a number of months without improvement. She finally returned to the author who, while in

the act of performing a tenotomy of the left superior rectus muscle, punctured the sclera with the sharp point of a Steven's scissors. The operation was stopped and the patient put to bed. For some reason unknown the headache ceased for six months. Subsequent history unknown. M. B.

MUSCLES.

CONJUGATE DEVIATION OF THE EYES AND HEAD AND DISORDERS OF THE ASSOCIATED OCULAR MOVEMENTS.—WEISENBURG, T. H., Philadelphia (*Jour. Am. Med. Assn.*, March 23, 1907), concludes that this condition depends on a most complex mechanism. There is a center for ocular motions in the posterior portion of the second and third frontal convolutions, a separate center for head movements, probably in the precentral convolution, and one for combined movements situated between the first two. The cortical centers are probably subdivided for lateral as well as for upward and downward movements, and in association with cortical centers for the other special senses. Hemianopsia is an infrequent and transitory accompaniment. Conjugate deviation is of no value as a localizing symptom, except in conjunction with other focal signs. It probably occurs in every large apoplectic lesion. Convergence and divergence are probably not reflex acts, but associated ocular movements, like movements upwards and downwards and to the side. P. H. F.

CONJUGATE PALSY OF THE UPWARD AND DOWNWARD MOVEMENTS OF THE EYES; REPORT OF TWO CASES.—SHANNON, C. E. G., Philadelphia (*Ann. of Ophthalmology*, January, 1907). The two cases reported were brother and sister, aged 9 and 16 years, respectively. The parents were healthy. There had been eight children, but three were dead of unknown diseases. Two of the five living children were healthy; the remaining three were feeble-minded. Two of the latter were afflicted with complete paralysis of upward and downward rotation of the eyes. The lateral movements were normal. The pupillary reactions were normal and the vision was $\frac{2}{3}$. The girl had no power of convergence. M. B.

CHRONIC EXTERNAL OPHTHALMOPLÉGIA.—POSEY, WM. CAMPBELL (*The American Journal of the Medical Sciences*, August, 1907). Patient, female, 16 years of age, negative family history, had marked ptosis, the palpebral fissure on the right side being reduced to 5 mm., that of the left to 3 mm. in breadth. Both eyes were fixed, the right eye looking straight ahead, with the left slightly divergent, and all motion was abolished, except when the

patient was requested to look down, when both eyes could be moved in that direction about 2 mm. Upon forceful efforts to raise the lids, the palpebral fissures on both sides were made 2 mm. wider. The pupils were 3 mm. in size and were active to light and accommodation stimuli. In the right eye vision equalled 5/ix and type 0.50 D. was read from 10 to 20 mm.; in the left, vision equalled 5/vii and type 0.50 D. was read from 10 to 20 mm. Dr. Weisenberg tested the muscles of the eyes and face for reactions of degeneration, but with negative results.

After describing the symptoms and course of chronic external ophthalmoplegia, Dr. Posey gives the opinion of Wilbrand and Saenger, who do not think this disease always arises in infancy, as shown by 32 cases collected by these authors, of which 6 developed in earliest childhood, 7 between 2 and 6 years of age, 5 between 7 and 20, 6 between 21 and 30, 3 between 30 and 53, while no record was made of the developmental period in 5 cases.

The affection is usually chronic from the beginning and its diagnosis not difficult and, as suggested by Wilbrand and Saenger, it can usually be differentiated from other forms of ocular palsy by three points: (1) The binocular character of the extraocular muscle palsies, including the levator; (2) the absolute non-involvement of other parts of the nervous system, and (3) the frequency with which the disease begins in childhood. It is often not easy, however, to differentiate the affection from congenital palsies, though in these cases the palsies are frequently unilateral, while in ophthalmoplegia externa they are always bilateral; congenital palsies are stationary, while those under discussion are progressive; and, finally, in congenital palsies there are frequently secondary deviations. Nothing is known of the pathogenesis, as no uncomplicated case has come to section.

M. D. S.

PARALYSIS OF THE FOURTH CRANIAL NERVE DUE TO TRAUMA, AND THE MEANS USED TO OVERCOME THE RESULTING PARALYSIS OF THE SUPERIOR OBLIQUE MUSCLE.—SNYDER, WALTER HAMILTON, Toledo (*Arch. Ophthalm.*, May, 1907, xxxvi, 388). In the above case there was a paralysis of the superior oblique, which increased during the first two weeks while the patient was taking iodids, and improved when the paralyzed muscle was exercised with the Worth-Black amblyoscope. The author calls attention to the comparative rarity of this form of paralysis and to the unusual method of treatment. He reports his case in detail and adds that "we may confidently expect a complete recovery of function in from four to seven months."

W. R. M.

THE TREATMENT OF STRABISMUS IN YOUNG CHILDREN.—BAKER, A. B., Cleveland (*Jour. Am. Med. Assn.*, July 13, 1907), lays stress on the early correction of refraction error. Contrary to the general belief of the parents and of some physicians, squint generally comes on slowly, being intermittent at first, then alternant, and finally persistent, with deterioration of sight in the deviating eye. Spontaneous cure occasionally occurs, and sight may be greatly improved by use. Nearly 75 per cent. of squint develops before the fourth year. Spectacles may be fitted as early as the end of the first year, as any child old enough to squint is old enough to wear glasses. In the earliest stage, atropinization of both eyes and disuse of accommodation may abolish squint. In persistent strabismus it may be necessary to use atropin for some time, train the fusion faculty, improve sight by bar reading, the stereoscope, and the amblyoscope. Full correction is important and it is rarely necessary to operate before the age of 10. Occlusion bandage may be of use. Operation is not required in squint which disappears under glasses and recurs when they are left off. Retinoscopy is the only accurate method. It is a great saver of time and patience and renders us independent of the little patient. Ophthalmometry is rather difficult in children.

P. H. F.

IMPORTANCE OF EARLY RECOGNITION AND TREATMENT OF SQUINT.—FOSTER, JOHN M. (*Colorado Medicine*, July, 1907). This paper was read before the Colorado State Medical Society and very nicely presents the present-day management of convergent squint cases. Foster calls the attention of physicians to the importance of the early recognition and treatment of cross eyes. He orders glasses at the second year, or as early as the squint is observed. Foster insists upon the patient being under constant observation and prefers the continued use of atropin in the fixing eye to using a blinder. In conjunction with the wearing of glasses, Worth's system of treatment with the amblyoscope is recommended. In those cases in which the above methods do not effect a cure operative treatment is applied. Foster states that when the vision is very much diminished in the deviating eye, although a perfect cosmetic effect may be produced by operation, binocular vision is not obtained in more than one-third of the cases. He "has found excellent results by forming a loop in the body of the muscle" when doing an advancement. General anesthesia is required for children.

He further calls the physician's and family's attention to the fact that glasses should continue to be worn after the operations.

H. V. W. AND S. G. H.

UNILATERAL INSTILLATION OF ATROPIN IN STRABISMUS CONVERGENS CONCOMITANS.—FROEHLICH (*Wiener Medizinische Presse*, May 11, 1907). The author recommends the instillation of atropin in the good eye in cases of stationary strabismus convergens. This method gives better results than with the use of atropin in both eyes. J. G.

CASE OF MONOCULAR OPHTHALMOPLÉGIA INTERNA AND EXTERNA, WITH PARALYSIS OF THE ABDUCENS AND TROCHLEARIS.—LANDMAN, OTTO, Toledo (*Arch. Ophth.*, May, 1907, xxxvi, 367), reports a case of complete monocular ophthalmoplegia with gradual implication of the muscles as follows: First, a ptosis; three days later an ophthalmoplegia external; five days after, an ophthalmoplegia interna, followed after an interval of three days by a paralysis of the superior oblique and external rectus and marked exophthalmus. Complete recovery followed antisyphilitic treatment.

W. R. M.

THE ETIOLOGY OF STRABISMUS.—LAGRANGE and MOREAU (*Archives d'Ophthalmologie*, April, 1907), with a view of determining the relative importance of the various causes of strabismus, have made careful examinations of 562 cases in the Children's Hospital of Bordeaux.

In 81 per cent. of the cases a vice of refraction was the chief, and in 38 per cent. it was the sole cause of the strabismus. In 43 per cent. the refractive error existed in connection with various complications, but in a certain number even of these cases a rapid cure was effected by optical treatment.

They found that alcoholism, nervous diseases, insanity and syphilis in the parents have relatively little importance as causes. In only 19 per cent. there was no error of refraction, and the strabismus must be referred entirely to diathesis and various constitutional defects. In this group many of the patients had an inheritance of pathologic conditions capable of affecting the nervous centers and consequent degeneration of the fusion center. In these subjects strabismus is induced by some slight cause, such as the use of a bandage on one eye or a slight opacity of the cornea.

In 1.59 per cent. the cause was muscular; a muscle was either congenitally shortened or atrophied.

In hereditary strabismus, the strabismus of the parents was due, in a large proportion of cases, to defective refraction and it was this that was transmitted. G. C. H.

PARALYSIS OF THE EXTERNAL STRAIGHT MUSCLE IN THE COURSE OF OTITIS.—TERSON, M. M. (*Annales d'Oculistique*, July,

1906), reports two cases and refers to others in literature, in which this paralysis, alone or accompanied by optic neuritis, has occurred in connection with otitis media and has not been due to intracranial lesions. He thinks it possible that it may be due to an infection through the venous and lymphatic anastomoses which associate the sixth pair with the middle ear through the carotid canal.

G. C. H.

ON THE STATE OF THE OCULO-MOTORS IN ORGANIC HEMIPLEGIA OF THE ADULT AND THE INFANT.—CHAILLOUS (*Ann. d'Oculistique*, October, 1906). Until the last four years it was a classic notion that the associated muscles of synergetic action are generally respected in the organic hemiplegia of adults (Charcot-Burchard); such muscles as those of the upper part of the face, of the abdomen, of the thorax, of the larynx and of the eyes which receive their motor influence from both hemispheres and retain their action by means of the grand hemisphere. More precise clinical observation, however, has tended to restrict this theory. Nothnagel and Wernicke have shown that the muscles of the thorax have less amplitude of excursion on the paralyzed side. Babinski demonstrated that the skin muscles, particularly those of the neck, contract less energetically on that side, and Simonneau and others found that the superior facial is involved in common hemiplegia.

From numerous examinations made with the aid of prisms and a comparison of the observations of other authors, Chaillos concludes that (1) at the same time with the muscles innervated by the superior facial, the thoracic, abdominal, etc., all the homologous muscles of the two eyes are affected by the paralysis; (2) in the organic hemiplegia of the adult, other things being equal, there exists a difference between the homologous muscles of the two eyes. The paralyzed side is more affected than the sound side; (3) the paralysis of the oculo-motor is in proportion to that of the muscles innervated by the superior facial at least in the earlier stages of the hemiplegia. Later this parallelism may become less evident; (4) the paralysis of the oculo-motors is in direct relation with the intensity of the hemiplegia when this is recent; (5) the oculo-motor troubles follow, in their evolution, the general laws of nervous pathology in relation to the hemiplegia; (6) the ptosis and the mydriasis and other troubles of the internal muscles are less frequent or at least disappear more rapidly; (7) in children, at least in cases of hemiplegia of some length of time, we do not find these disturbances of the homologous muscles. Probably because our ob-

count of the age of the subjects, the muscles of the paralyzed side adapt themselves to the new conditions.

G. C. H.

A CASE OF PSEUDO-PARALYTIC PTOSIS FOLLOWING AN ACCIDENT.—BETTREMIEX (*La Clinique Ophthalmologique*, May 10, 1907). The author saw this case in revision a month after the accident, the matter pertaining to the injury having been settled in July, 1906, by a pension corresponding with a reduction of 8 per cent. in professional capacity.

The patient, a carpenter, 22 years old, was injured March 10, 1906, by the falling of a heavy piece of wood which produced a right fronto-parietal contusion with cerebral concussion. The injury did not seem to produce any serious consequence, and at the end of March the man returned to work. He complained in April that the vision of right eye had diminished and the question was raised whether there was an optic nerve lesion. Bettremieux saw the case May 3, and found a complete closure of the right eye with lowering of the corresponding eyebrow, which eliminated the diagnosis of a veritable ptosis. There was no appreciable lesion discovered by ophthalmoscopic examination. The pupillary reflex was normal; patient complained of a pronounced amblyopia of right eye. From several proofs of simulation, Bettremieux believed that the amblyopia was feigned, and two confrères confirmed that opinion, which was based on the fact of the association in the same subject of hystero traumatic blepharospasm and simulated amblyopia. Such a combination would be an exception to the rule of Parinaud, that amblyopia or amaurosis does not occur with blepharospasm. There was anesthesia of the pharynx and nearly complete right hemianesthesia with a few zones of intermittent sensibility; the knee tendon reflex was normal; the right plantar reflex was suppressed. The visual acuity of the left eye was normal; the limits of the field for this eye were approximately the same for all directions, 30° for white, 20° for red and green, and 10° for blue. Medical treatment and electrization gave no result. Operation for ptosis was refused. Bettremieux believes it would be more just in disability resulting from injury to insist on the lapse of a longer period before deciding as to the amount of indemnity.

B. E. F.

MYOPIA.

MYOPIA ASSOCIATED WITH OPACITIES OF THE CORNEA.—PYLE, W. L., Philadelphia (*Jour. Am. Med. Assn.*, July 20, 1907), reviews the literature and comes to the following conclusions: Corneal opacities are a frequent cause of axial myopia which is not

dependent on the corneal curve. The pathogenesis is that of the common form; convergence, congestion, pressure of external ocular muscles plus the predisposing factor of ocular tissues weakened by previous inflammation. The association of chorioidal or retinal disease with affections of the anterior segment of the globe is an important factor in still further lowering vision. Extensive fundus lesions are common and the myopia is likely to be progressive. In unilateral opacity, myopia may appear in the sound or the affected eye, but generally first or more markedly in that used most exclusively for near vision. It may be bilateral. In opacities of both eyes the myopia is almost always bilateral and more marked in the eye with the least corrected visual acuity. When unilateral, it generally occurs in the eye with the least opacity and suggests ciliary strain rather than excessive convergence as a factor in "myopogenesis" (?P. H. F.). All corneal affections, especially phlyctenulæ, should receive prompt and continuous attention. Recurrences should be guarded against. Energetic measures should be taken to clear up the opacities. Subsequent myopia may be prevented by careful and repeated refraction tests under a cycloplegic and the constant use of correcting lenses. All errors in ocular and general hygiene which encourage the development of myopia should be avoided.

P. H. F.

ON THE CONTROVERSIES AS TO THE DIFFERENT FORMS OF MYOPIA.—AKS, F., Lund (*Ztschr. fuer Augenheilkunde*, April, 1907, xvii, p. 349). Myopia in all its forms represents a morbid change, as it leads to an impairment of the normal function of a very important organ, but not every myopia is a disease in the anatomopathologic sense, characterized by pathologic changes of the histologic structure of an organ. The deleterious, malign myopia is such a disease, a kind of degeneration.

School myopia is the most frequent form and is an anomaly of growth, but no disease. Aks is an adherent of Stilling's muscular theory and considers reading in recumbent position as one of the chief factors in the etiology of this form. It is an affection of the growing eye and its chances of development end at the age of 25, when the whole organism has finished its growth. An axis myopia developing after the age of 30 is a rare exception, and may be only apparent, being caused by physiologic decrease of vision. School myopia leads to no other alterations of the fundus but the very frequent partial conus. The majority of the hygienic prophylactics have not been victorious in the combat against the common school myopia. The deleterious myopia has been neglected by them, al-

though it requires especial consideration. Without entering this subject, Aks emphasizes the importance of appointing school oculists as advocated by H. Cohn, Pause and others. C. Z.

THE TREATMENT OF MYOPIA.—HESS, C. (*Archiv für Augenheilkunde*, v, 56. *Wiener Medizinische Presse*, April 14, 1907). The author opposes the removal of the lens in cases of high degree of myopia, because statistics show that bleeding opacities of the vitreous and detachment of the retina are of more frequent occurrence in operated than in non-operated cases.

The most appropriate treatment consists in the full correction of the refractive error with concave glasses. The most reliable method of examination is the subjective one. J. G.

THE SCHOOL AND MYOPIA.—SCHNABEL, Wien (*Wien Med. Press*, 1906, No. 16. Abstract from *Die Ophth. Kl.*, March 20, 1907). Out of 15,300 dispensary patients there were 300 myopes with at least 10 D. of M. and 758 with less than 10 D. In the first class there were 19 under 12 years of age with an average M. = 13 D. In 26 there was in one eye an H., Em., or low M., in the other eye an M. = 10 D. or more. If the M. occurred in the year of the beginning of near work, it could not be attributed to the near work, as the other eye which had been subjected to the same work remained with Em., H. or low M., notwithstanding that this eye frequently bore the burden of the work. As the male sex were more exposed to the danger of middle school instruction, high M. should have been found more frequently in the male, but in Schnabel's figures there are 161 females and 139 males.

Dividing the 236 myopes whose calling was known into two classes, artisans and workers with the eyes, it was found that there was 71 per cent. of the former and 29 per cent. of the latter. The group of 758 myopes of less than 10 D. is divided into two classes, those of more and those of less than 6 D. The myopes of middle grades were composed almost equally of males and females and of artisans and eyeworkers. The M. was caused by eyework not at all or rarely. Six hundred and seven individuals had a M. of less than 6 D. and of these 43 were not over 10 years of age. That in 100 males of the lowest grades of M. 7 had not passed the tenth year shows that M. of low and medium grades occurs not rarely before the period of life in which eyework is begun. But the influence of near work in the origin of M. of lowest grades is plainly seen in the fact that the male sex provides 73.4 per cent. and the female sex 26 per cent., and that of these 517 males 77.4 per cent. were eyeworkers and 22.6 per cent. artisans.

Anatomical study has shown that in M. of high grade, almost without exception, is accompanied by posterior staphyloma and it will show whether posterior staphyloma is present in M. of middle and low degrees. Schnabel states that his early observations have been confirmed, that eyes with less than 8 D. of M. do not, as a rule, have posterior staphyloma and that in eyes with M. greater than 10 D. it is rarely absent. School is innocent of the development of posterior staphyloma. It causes an eye to become myopic, but not diseased.

Em. is not an ideal, but a conveniently chosen standard by which to judge of the refraction conditions. The hypermetrope who becomes myopic in school has good reasons to be thankful, the emmetrope loses through change in the refraction so long as he is young, but gains in the years of beginning presbyopia. W. Z.

OPERATIONS.

METHOD OF PERFORMING TENOTOMY WHICH ENABLES THE OPERATOR TO LIMIT THE EFFECT AS REQUIRED.—TODD, F. C., Minneapolis (*Jour. Am. Med. Assn.*, July 13, 1907), advises for degrees of squint under 13° a new form of partial tenotomy, as he has found that of Stevens unsatisfactory and entirely ineffective. He severs a portion of the tendon on one side by an incision at right angles to the muscle and about half way through it, and makes a similar incision in another place on the opposite side of the muscle, situated a short distance longitudinally from the first incision, severing the remaining fibers and thereby lengthening the tendon. No lengthening will take place until every fiber is severed in one place or another. The operation may be used for insufficiency with latent deviation. P. H. F.

OBSERVATIONS ON METHODS OF ADVANCEMENT.—COGAN, J. E. (*Ohio State Medical Journal*, July 15, 1907), first points out what he considers to be the unsatisfactory points of some of the well-known methods of operating. He particularly discusses Worth's, Stevenson's and de Schweinitz's methods. He minutely describes his operation and makes it plain by a good illustration. He claims that the advantages of the operation are: No unnecessary constriction or strangulation of the muscle. No posterior stitch to pull forward. The muscle hold is adjustable, pulls at cross axis of muscular fiber and constricts only the amount required. The field of operation is exposed while muscle is being advanced, and it is all advanced by the one knot, the final knot acting as additional security, the suture can be easily removed. He calls attention to the dangers of deep scleral suturing, as he found in several pigs' eyes that the

suture had penetrated the vitreous. He describes a method of placing the purse-string suture through the conjunctiva around the cornea.

M. D. S.

THE OPERATION OF TRANSPLANTATION OF THE CORNEA.—O'MEARA, E. J., Mirzapur (*The Indian Med. Gazette*, March, 1907). As such a very large proportion of the population of India suffer from opacities of the cornea in varying degrees and are thereby rendered totally blind, the author has for some time been working out and practicing details of the operation of transplantation of the cornea. He has not as yet operated in cases of slight opacity, but only those in which the patient was unable to perceive light.

Operation.—One or both eyes having been prepared as for a cataract operation, I estimate the thickness of the leucomatous cornea by careful inspection and transfix with a cataract knife at distances from the sclerotic margin varying from the thickness of the leucoma; having transfixed, the knife is carried with a gentle sawing movement to the upper margin of the sclera; the flap thus raised is seized with forceps and divided with the knife at its lower attachment, care being taken that this division is perfectly even and level with the rest of the section.

Inspection of the cornea is now almost certain to show one or more thin, semi-transparent, possibly slightly bulging areas; these are very carefully avoided, and section after section, each thinner than the last, is cut by transfixion from the remaining opaque cornea; after each section the perception of light is tested.

Successive sections should be cut until the danger of opening the anterior chamber with escape of aqueous humor is imminent; the patient may now possibly be able to count fingers; but this is not essential, only a good perception of light being required.

In many cases the leucomatous cornea and iris are blended into one cicatricial mass, and the case at first sight appears hopeless; in others, again, a portion of iris clear and not adherent is seen, which will allow of a secondary operation for iridectomy.

If, during any stage of the operation, the anterior chamber has been opened, and even the smallest point of aqueous humor escapes, the operation must at once be abandoned for from three to five days, after which the cut surface is freshened up at the edges and the operation continued.

When the sections of the patient's cornea have very nearly been completed, an assistant in an adjoining room chloroforms a pariah dog; immediately the dog is dead, the very strong fibrous ring

round the orbit is freely divided with a scalpel and the conjunctival sac opened up at both canthi; this is necessary as the dog's eye is deeply set.

Two or four sutures of fine silk are now passed through the dog's cornea at equal distances round the margin; formerly I passed the sutures either after division of the cornea from the rest of the eye, or after it had been applied to the patient's eye, both of which are difficult, and cause much undesirable manipulation of the cornea. The entire cornea is now removed by cutting round at the sclerotic margin with a cataract knife; scissors should be avoided; this division is made nearly horizontal, giving the margin of the cornea as large a base as possible by which to adhere.

All bleeding points of the leucoma having been most carefully stopped with adrenalin solution and the small blood dots removed with salt solution, before the transplanted cornea is placed in position.

The dog's cornea with the sutures *in situ* is now either first washed in salt solution or directly placed on the patient's eye. The lower end of each suture is now threaded and passed through the ocular conjunctiva, and when all are in position they are tied, the greatest care being taken that there is not the least tension.

As regards this part of the operation I have used (1) one, two, three and four sutures; (2) no sutures at all, simply placing the transplanted cornea on the patient's eye and applying the dressing; and (3) placing the cornea on the eye without sutures, but putting a single suture through the upper and lower lid and drawing them together for the first two or three days.

Union of the transplanted cornea has been obtained by all of these methods, but I am in favor of either two sutures of the cornea or a suture of the lids.

The lids are not dusted with iodoform, but simply a cataract pad and bandage applied in the usual way.

After-treatment.—Irrigation daily with salt solution after the second day.

The transplanted cornea heals in a striking way, the dog's cornea being larger than that of the patient's, the central part is, so to speak, punched out, the margins coming away as a complete ring in the majority of cases.

The transplanted cornea may become opaque from:

1. Excessive manipulation, or perhaps also over-immersion in salt solution, in from two to five days.
 2. From contact with aqueous humor, in from one to three weeks.
- If the transplanted cornea does not unite at once, hope should not

be given up, as in one case a completely detached cornea without sutures united seven days after the operation and remained clear.

F. A. AND P. G.

AN OPERATION FOR ENTROPION.—HEARD, R., Simla (*The Indian Medical Gazette*, June, 1907). The large number of operations devised for the treatment of entropion may be taken as an indication of the difficulty experienced in dealing satisfactorily with this condition.

The author states that the results, in some hundred cases, have been most gratifying and have left little to be desired.

The steps of the operation are as follows: Snellen's clamp is applied and the lid adjusted so as to expose its edge as much as possible. The bosses of the first and second fingers of the left hand are placed upon the lid, as in Figure 3, and firmly pressed in an upward and backward direction, so as to bring the hairs well into view and into a straight line. In this position the free border of the lid is split, from end to end, to a depth of about 7 mm., taking care to keep the incision well behind the hair follicles. The edge of the anterior flap, containing the hairs, is picked up and steadied by a fixation forceps, while a second incision is made, from end to end, through the skin only along its anterior border, parallel to and 2 mm. from the line of hairs. The edge of the skin forming the upper border of this incision is now picked up by a couple of fine toothed clip-forceps, by means of which an assistant puts the skin on the lid upon the stretch, by traction in a downward direction to facilitate the making of the third incision. The third incision is a curved one, shaped not unlike the curve of the free edge of the soft palate and uvula; it is made through the skin only, and extends from one end to the other of the second incision, the height of the curves depending upon the effect required. The forceps are removed, the piece of skin contained between the two skin incisions is dissected off, leaving a raw surface.

The edges of the skin incision are brought together by seven horsehair sutures, the central one being put first, those through the curves second, and those at the extremities last, and after the clamp has been removed, as, by so doing, their insertion is facilitated and their exact position the better judged. The suture should take a good hold of the edge of the lid, passing among the hairs if necessary. They are tied by a double twist only, the upper ends being cut off fairly long, to facilitate subsequent removal, while the lower ends are cut off close to the twists. Any hemorrhage is arrested by pressure, and the clot removed from the edge incision, which is

left open. A semi-circular pad of gamgee tissue is applied over the orbit and the everted hair, and retained in position for 24 hours, by a bandage. The stitches are removed on the fourth or fifth day.

The immediate effect of the operation is a perfectly straight edge, with the lashes turned well outwards from end to end. There is no gaping of the palpebral fissure, and the lids meet perfectly.

If, during the splitting of the lid, at the commencement of the operation, some of the follicles are accidentally divided and remain in the conjunctival portion of the flap, they should be dissected out, as otherwise a few hairs may appear subsequently along the line of scar.

F. A. AND P. G.

ACQUIRED DOUBLE EXTERNAL OPHTHALMOPLÉGIA; OPERATION UPON THE PTOSIS BY ADVANCEMENT OF THE LEVATOR COMBINED WITH THE SUTURES OF DRAUSART.—FROMAGET (*Ann. d'Oculistique*, October, 1906). The tendon was detached from the margin of the cartilage and sutured to the tarsus. The result was fair, but incomplete on account of loosening of the sutures due to dragging by the constant movement of the eyelids. A few weeks later the operation was repeated and after the tendon was sutured a suture, in the form of a loop passing from above the eyebrow, was inserted on each side of it, which produced an excessive raising of the lid and prevented all dragging while union was taking place. The extra sutures were removed at the end of ten days, and the result was entirely satisfactory.

G. C. H.

EXTIRPATION OF ORBITAL TUMORS, WITH PRESERVATION OF THE EYE, BY CURVED CUTANEOUS INCISIONS.—ROLLET (*Arch. d'Ophthalmologie*, March, 1907). Rollet reports three cases of orbital tumors removed by means of large curved incisions of the skin, with concavity towards the ball, and holding the ball aside with a blunt instrument. The inferior conjunctival cul-de-sac is not opened. He says he prefers to explore the orbit with the finger rather than with the eye and thinks that the indications for the Kronlein operation are exceptional and confined to tumors of considerable size.

G. C. H.

THE COLORED TATTOOING OF THE CORNEA.—CHEVALLEREAU and POLACK (*Annales d'Oculistique*, July, 1906), give the credit for introducing tattooing the cornea to Wecker and Abadie, but these authors used only India ink. Archer made experiments with coloring matter and concluded that ultramarine blue, tene de Sienne and India ink are excellent; that indigo and Prussian blue are fairly well tolerated, but that gamboge excites serious inflammation.

Archer uses for white, carbonate of lime; for blue, Prussian blue; for yellow, ochre; for black, India ink, and calls in the aid of an expert painter in mixing his colors.

Merck has prepared a pigment from the chorioid of oxen, but its advantages do not compensate for its great expense.

Cofler states that Japanese cinnabar mingled with black gives all necessary tints of brown and is perfectly well tolerated, and that combined with Japanese blue it produces all the desirable color effects.

The authors prefer to dispense with the aid of a painter and give a long list of pigments which imitate directly the colors of the iris.

G. C. H.

THE FILTERING CICATRIX IN THE TREATMENT OF GLAUCOMA; AN IMPROVED OPERATION.—HERBERT, H., Bombay, India (*Ophthalmoscope*, June, 1907). The author's operation is difficult to redescribe. Briefly summarized, it consists in forming a wedge-shaped segment of sclerocorneal tissue by making a Y-shaped incision. The right hand side of the Y is the primary cut and the left hand side the secondary cut. The top of the Y is at the surface of the eye and the end of the stem in the anterior chamber. The knife used is a very narrow linear blade which enters the anterior chamber and emerges at a point to leave from 3 to 4 mm. of tissue between. As the incisions through the sclerocorneal tissue are completed they do not cut through the conjunctiva. This bridge of conjunctiva serves to hold the wedge-shaped piece of tissue in place. His theory is that this piece of tissue acts somewhat like a graft, that it shrinks and prevents primary union, thus forming ultimately a filtering cicatrix. I neglected to state that he makes a flap of a part of conjunctival bridge through which a small iridectomy is performed. He has performed 38 of these operations, and all have been successful during the period under observation, three months. The author has left India and in consequence will be unable to follow them further.

M. B.

INFILTRATION ANESTHESIA IN OPHTHALMOLOGY.—STUTZER, H. G., Coeln (*Ztschr. fuer Augenheilkunde*, xvii, Juni, 1907, p. 518). Narcosis in ophthalmology has many disadvantages, one of which is that asepsis may be infringed. Wherever it can be dispensed with, it ought to be avoided. Therefore, Stutzer extensively practiced infiltration anesthesia for the last 10 years. He uses eusemin, a mixture of 0.0075 cocain and 0.00005 adrenalin in 1 c.cm., which comes in bottles of 1 to 2 c.cm. with molten mouths. The anesthesia is complete 15 minutes after injecting the solution into the

tissue of the field of operation, e. g., for iridectomy under the conjunctiva, parallel to the region of the cornea, where the section is intended to be.

Enucleation under infiltration anesthesia ought to be performed only on painless globes. Stutzer, however, does not employ infiltration anesthesia in enucleation unless there are stringent contraindications to a general narcosis, as he observed that even very strong men suffered a shock, the consequence of which they could not overcome for a long time.

In operations on the lids and the tear sac, infiltration anesthesia may be advantageously combined with the conduction anesthesia of Oberst, for instance, for a relatively painless extirpation of the lacrimal sac, by anesthetizing the infra-trochlear nerve and the branches of the infra-orbital nerve running towards that region. On account of the abundant blood and lymph currents at the tear sac, an injection of eusemin into the whole area is made 10 minutes previously, to bring about a contraction of the blood vessels. Then a few drops are injected as far as the periosteum below the upper trochlear and the crista lacrimalis, and after 15 minutes the operation may commence.

C. Z.

EVENTRATION AND ENUCLEATION OF THE EYEBALL UNDER LOCAL ANESTHESIA.—SIEGRIST (*Wiener Medizinische Presse*, June 2, 1907). The author employs for the purpose a glass syringe holding 2.0 gm. with a slightly bent needle. The conjunctiva is thoroughly anesthetized with 3 drops of a 2 per cent. cocain solution to which a few drops of adrenalin have been added. Now he grasps the conjunctiva, together with the capsule, by a forceps or the bent needle with the concavity directed towards the eyeball, and inserts the needle into the folds of mucous membrane; the point of the needle is then pushed between the orbital wall towards the entrance of the optic and ciliary nerves; 0.75 gr. of a 2 per cent. novocain solution, to which also some adrenalin has been added, is now injected into the upper, lower, temporal and nasal sides of the bulb. The enucleation or eventration may be commenced from one to two minutes after the injection, and the patient will experience absolutely no pain.

Novocain is less dangerous than cocain and, therefore, more preferable; the author injected in one case 3.0 gm. of novocain without producing any intoxicating symptoms. J. G.

OPTIC NERVE.

NEURITIS OF THE INTRACRANIAL PORTION OF THE OPTIC NERVE.
—GRADLE, H., Chicago (*Arch. Ophth.*, March, 1907, xxxv, 201).

gives the clinical histories of three cases of optic neuritis limited to the intracranial portion of the nerve. He considers the transient failure of sight to be due to a diffuse neuritis involving the intracranial portion of the nerve, and gives the clinical characteristics as follows: "Sudden diminution of sight, without central scotoma and with nearly normal field, but with decided impairment or abolition of color perception throughout the field, tendency towards recovery, but possibly ending in incomplete atrophy, with absence of all other symptoms except initial headache." Gradle considers syphilis to be the most probable cause of the lesion. W. R. M.

HYDROTHERAPEUTIC TREATMENT OF OPTIC NEURITIS.—LEZENIUS, A., St. Petersburg. (From the eye clinic at St. Petersburg. *Klin. Monatsblätter fuer Augenheilkunde*, xlv, Maerz, April, 1907, p. 340.) The optic nerve reacts readily to anomalies of nutrition of the brain. If the lowered nutrition of the brain is improved the optic nerve is better nourished and may regain its functions as far as its fibers are not entirely atrophic.

This may be obtained by stimulating the cerebral circulation and the absorption of exudations through hydrotherapeutics, viz., pouring of cold water of 11° (Réaumur) over the head of the patient while taking a warm bath of 29°. It is indicated in optic neuritis potatorum, after typhoid and chronic meningitis and requires strict individualization. Lezenius had excellent results in a case of optic neuritis potatorum and another following typhoid. V. was restored and the severe headaches cured.

In a woman, aged 34, with atrophy of the optic nerve after typhoid, V. rose from counting fingers near by to 0.2 and almost complete restoration of the contracted visual field. In another case of incomplete atrophy, vision increased to four times its initial amount, and the borders of the visual field became normal, and in a third case with pale discs, veiled borders, thin arteries and headaches, V. rose in one eye from counting fingers at 1 m. to 1.5 m. The headaches ceased entirely.

Hydrotherapeutic treatment of a case of bilateral neuroretinitis in a woman, aged 36, who from five to six years had been suffering from headaches during menstruation, cured the headaches and the eye affection after three weeks, so that the ophthalmoscopic conditions of both eyes were normal. The clinical histories are given in detail. C. Z.

RESEARCHES ON THE ORIGIN AND DEVELOPMENT OF THE EPIBLASTIC TRABECULE AND THE PIAL SHEATH OF THE OPTIC NERVE OF THE FROG, WITH ILLUSTRATIONS OF VARIATIONS MET WITH IN

OTHER VERTEBRATES AND SOME OBSERVATIONS ON THE LAMPHATICS OF THE OPTIC NERVE.—GRADON, J. T. (*Quart. Jour. Microscop. Sci.*, 1906, vol. 1), felt dissatisfied with Assheton's (same jour., vol. xxxiv, 1892) conclusion that the cells of the optic stalk do nothing more than serve as a conductor for the fibers of the optic nerve, which opinion was fully endorsed by Ryder in the embryological section of "Norris and Oliver's System of Diseases of the Eye." He found after finishing his researches that the part of the epiblastic trabeculæ that he speaks of as transverse had been dealt with by W. Müller, Kölliker, Robinson, Studnicka and Friorip. Summary: The trabeculæ are entirely epiblastic in origin, as the entrance of the nerve fibers along the ventral wall of the embryonic optic stalk produces a confluence and stretching of the protoplasmic fibrils of the epiblastic cells of the stalk, which result in a complex framework of supporting elements radiating in every direction from the border of each nuclei of the stalk, and this complex framework afterwards becomes more or less differentiated into a transverse, oblique, and longitudinal trabeculæ with the multiplication of the nuclei of the stalk and without any admixture of mesoblastic cells, and the nerve fibers lie, throughout the whole of their course, in the optic stalk, within the membrana limitans externa, on the outside of which we have followed the gradual formation of the connective-tissue layer of the pial sheath.

The obliteration of the lumen of the stalk can be ascribed to various causes operating within the stalk itself and outside it, though chiefly to the ingrowth of nerve fibers.

In the development of the optic nerve of the frog there is a period of slow growth, followed by one of great activity, which later is due to a greatly increased flow of lymph into it by means of the elaborate system of minute channels that follow the course of each fibril of the epiblastic trabeculæ, and consequent upon the formation of the arachnoid sheath and the enclosure of the subarachnoidal lymph space. The cells of the optic stalk perform the following three functions: 1. They conduct the nerve fibers, which, in their turn, resolve the constitution of the cells of the stalk so that they, 2. provide the nerve fibers with a supporting framework which, 3. provides the whole interior of the optic nerve with an elaborate system of minute lymph channels.

E. E. B.

ORBIT.

HEMORRHAGES WITHIN THE ORBIT, WITH REPORT OF A CASE OF SPONTANEOUS ORIGIN.—TOOKE, FRED T., Montreal (*Ophthalmic Record*, April, 1907). Intra-orbital hemorrhages are classified as

(1) traumatic and (2) non-traumatic or spontaneous. The former is of rare occurrence and the latter is decidedly rare. The case is reported of Mrs. L., aged 42, who had suffered from a dull pain in the left brow for some time past. This pain was exaggerated when she laid down on her left side. She was awakened one night from a sound sleep by an excruciating pain over the left eyebrow. The brow and left side of the face were much swollen and the eyeball protruded. The pain gradually became less and disappeared in three hours. The eyelids were greatly swollen and ecchymosed. The eyeball was displaced upward and outward and movements in all directions were impaired; vision *nil.* As the swelling of the lids subsided, vision gradually returned, but never improved beyond 6/xxiv. No fundus lesion was ever discernible. The ocular movements became normal and the general appearance of the eye and the external parts became normal.

M. B.

MUCOUS CYST OF THE ORBIT WITH OILY CONTENTS.—SPERBER, E., Olmütz (*Centrbl. fuer Augenheilkunde*, Mai, 1907, p. 129). Cysts of the orbit are rare. While a great number of dermoids have been published, mucous cysts are less frequent. Sperber describes such a case in a man, aged 52. At the right upper nasal corner of the orbit a round fluctuating tumor had displaced the eyeball downwards and outwards, causing diplopia. After an exploratory puncture had evacuated yellowish green mucus, the cyst was incised and a cavity opened of 3.5 by 4 cm. As a total extirpation of the thin wall of the cyst was impossible without endangering the contents of the orbit, it was sewed to the skin and a fistula established, which healed completely within six months. A careful chemical analysis and microscopic examination of the contents of the cyst revealed red blood corpuscles, lymph corpuscles, yellowish drops and granules, cholesterolin, chiefly mucin. Similar cases are quoted from literature and the differential diagnosis from meningocele, echinococcus and dermoid cysts is discussed. Mucous cysts (mucocoele) develop either from orbital bursæ mucosæ or from an invagination of the fetal nasal mucous membrane into the orbit.

C. Z.

NEURO-FIBROMA OF THE ORBIT; KROENLEIN OPERATION.—PARKER, W. R., Ann Arbor (*Jour. Am. Med. Assn.*, July 6, 1907), reports a number of cases from literature and one from his own practice in a male of 28. There was exophthalmus downward and outward, with limitation of motility, double vision, good sight and normal fundus. A tough tumor was felt deep in the orbit appearing to surround the globe, to which it was not attached. Curved

incision over the temple extending along the outer margin of the orbit, dividing the periosteum and running backward along the upper edge of the zygoma. Periorbita and orbital contents resected. Lateral wall cut through with a chisel, above, in the suture between the great wing of the sphenoid and the malar bone, and below in a horizontal plane directly above the insertion of the zygomatic arch. This piece of bone with its soft tissues attached was forced backward, giving free access to the orbit. The periosteum was then divided horizontally, and the tumor extirpated without difficulty. It proved to be a kidney-shaped mass, imbedded in which were the frontal, supra-orbital and supra-trochlear nerves. It had evidently originated in the sheath of the frontal. Two cases in literature were below par mentally, suggesting the possibility of similar intracranial nodules. (?No symptoms of irritation or paralysis as would be caused by such growths. In regard to the use of a chisel in the Kroenlein operation, Czermak advises against it on account of the danger of fracture or splintering of the orbit and consequent injury to the optic nerve, and prefers the Gigli wire saw. P. H. F.). In the discussion it was noted that neuroma may develop into sarcoma; that plexiform neuroma, more commonly found about the eye, are false or fibro-neuromas. Kroenlein's operation is a great aid in non-malignant growths or in others which are not intimately attached to the globe. In many cases it is possible to remove a tumor, especially if it is situated above the globe, by incision along the brow without resection of the bony wall. In cases of decided malignancy with probable involvement of the globe, exenteration of the orbital contents is to be preferred. P. H. F.

PARASITES.

EYE SYMPTOMS OF SPORADIC TRICHINOSIS.—PARKER, F. J., New York (*Med. Record*, Aug. 3, 1907), reports six cases of this interesting affection, four of which were characterized by early involvement of the eyes. The important diagnostic points are: Muscular pain and tenderness due to myositis, edema of the lids with tenderness of the globe and painful rotation, due to the same cause, fever resembling that of typhoid, leucocytosis ranging from ten to twenty thousand, eosinophilia from 10 per cent. to 70 per cent., and the detection of the trichinæ or of inflammatory areas between the muscle fibers. Trichinosis should be excluded before making a diagnosis of muscular rheumatism, orbital cellulitis or adenitis of the lacrimal glands. P. H. F.

PHYSIOLOGY AND PATHOLOGY.

MODERN VIEWS ON PHYSIOLOGY AND PATHOLOGY OF ACCOMMODATION.—Hess, C., Wuerzburg (*Jour. Am. Med. Assn.*, July 20, 1907), notes that purely practical questions, such as the treatment of presbyopia, of myopia, of glaucoma, must be influenced by our views on accommodation. He reviews the modern standpoint in the light of the well-known studies of Tscherning, Crzellitzer, Grossman, as well as original experiments. It can be demonstrated that when the ciliary muscle is contracted *ad maximum* in the normal eye the lens sinks downward about 0.5 mm. and becomes tremulous behind the iris. Dilating the pupil with homatropin and then instilling eserine, the latter acts more quickly on the ciliary muscle than on the sphincter, and complete slackening of the suspensory ligament can be observed with a dilated pupil, not only in the aged, but even in young children with lamellar cataract. This is also shown by trembling of Purkinje's reflexes and by displacement of the entoptic image of the lens during accommodation. The later change being due to gravity, it does not take place when the head is inclined so far forward that the iris lies in a horizontal plane. Head tilting does not affect the displacement. If the ciliary muscle be contracted *ad maximum* by eserine, voluntary accommodation efforts cease to have any effect on the lens, but gravity is now able to affect it much more strikingly, and the displacement generally amounts to almost 1 mm. Capsular opacities and the anterior epithelium, which can be distinguished as a fine shagreen, participate in the movement. This and the anatomic impossibility of the lens fibers being displaced without motion of the capsule dispose of Tscherning's hypothesis that accommodation caused tension of the zonule, and his attempt to explain the contradictory evidence of downward displacement of the lens reflexes by the assumption of a slackening of the lens-capsule and sinking of the intra-lental substance. Grossman's finding of a posterior lenticonus in animals' eyes frozen and sectioned while in accommodative spasm could not be confirmed by Hess. In the cow, tightening of the zonule produces increased convexity of the lens. This can not be applied to human eyes, the accommodative power of the bovidæ being small, and children's and monkey's lenses show an opposite condition. The ciliary muscle comes forward in accommodation. This can be seen very beautifully in iridectomized eyes with cataract. Hess has observed little tent-like elevations on the anterior surface of the lens along the equator caused by the traction of the zonular fibers at the lens surface. They are most clear in the atropinized eye, disappear under eserine more or less completely, and the equator

then appears to have a much more regular form. The increased sphericity of the lens in accommodation can not be due to pressure of the intra-ocular fluids, as it takes place normally in eyes in which the factor of the vitreous has been completely eliminated by a hole in the sclera and chorioid. Intraocular pressure must always be the same in the anterior and posterior part of the normal eye, and manometric measurements in the aqueous will accurately indicate it. Such measurements show that even maximum accommodation has absolutely no influence on tension. The manometer used was so delicate that it showed most exactly the variation of intraocular tension with pulsation of the blood vessels. In mammals, with the exception of man and the simidæ, the accommodative power is small, averaging from 1 to 4 D. In birds, on the contrary, the mechanism is much like that in man and the range of accommodation is 12 to 14 D. and more. Here, too, it was found that accommodation had absolutely no effect on intraocular pressure, while the slightest contraction of the extrinsic eye muscles had a marked effect on tension. We may, therefore, disregard the factor of accommodation in the development of myopia, and there is no objection to full correction, which, on the contrary, enables the patient to read and write at a considerable distance and so prevents convergence, the truly dangerous element. We have been accustomed to fear accommodative effort in glaucoma on account of the erroneous view that it is accompanied by an increase of intraocular tension. As a matter of fact, the reverse is true, as might have been assumed in view of the beneficial action of eserine. As to the mechanism of accommodation, it has generally been supposed that the near point approaches the eye more and more as accommodation is exerted and that the maximum of lens convexity corresponds with the maximum of contraction of the ciliary muscle. This is fallacious. When the muscle contracts, the shape of the lens changes only to a certain degree, depending on the age of the subject, after which no further change takes place, increased contraction allowing the lens to be displaced downward by gravity, but having no effect on its shape. The true near point remains where it was, the range may be called the manifest range of accommodation. With the increased accommodation just mentioned there is associated a contraction of the pupil which allows us, with the objective measures in general use for determining the punctum proximum, to bring the test object a little nearer the eye. This is an "apparent near point," and is not due to any increased sphericity of the lens. Eserine acts similarly. Any patient can contract the ciliary muscle much more than is necessary for maximum accom-

ity of the lens. This "latent range of accommodation" can not be determined objectively. It increases with age, and at 65 or 70 the whole muscle contraction is latent, but the muscle may be as strong and energetic as in youth. There is no such thing as senile atrophy of the accommodative muscle, and no greater effort is required in the aged to increase lens convexity. The same contraction may at different ages produce exactly the same increase of lens convexity, and the association between accommodation and convergence being congenital and practically unaltered during life, the muscle does not become inactive and can not atrophy. Hence, while in a young patient of from 10 to 15 years of age a slight paresis of the ciliary muscle may be detected by the recession of the near point, a much higher degree of paresis may exist undetected in patients of from 40 to 50, as the error will not become manifest unless it exceeds the latent range of accommodation. In later life the effect of cocain, which leaves the punctum proximum where it was, on the ciliary muscle, is shown entoptically by the fact that there is no displacement of the lens during accommodative effort. Accommodation spasm *per se* can not cause or increase myopia. The range of accommodation is the same in myopia and hypermetropia and varies only with age. No amount of accommodative exercise can have any effect on the maximum of lens convexity. Eye-strain may be caused in hypermetropia by accommodative effort, but it is impossible in old emmetropic eyes, as increased contraction of the ciliary muscle in presbyopia is of no use in reading. The index of refraction of the lens substance does not increase continuously, as was generally believed, from cortex to nucleus. From the age of 20 to 25 on there is a sudden increase of refraction at the limit of the nucleus, and the difference of refraction between nucleus and cortex increases with age. Hess has demonstrated this by the discovery of two more lens reflex images, analogous to those of Purkinje and referable to the anterior and posterior surface, respectively, of the nucleus. These nucleus reflexes can be seen clearly in normal lenses at the age of 40 or 50 as distinct as those of Purkinje. Hence we have in the lens not only two but four refracting surfaces, and the influence of the nucleus surface increases with age. This disposes of Donder's theory that senile hypermetropia could not be explained by increase of the cortical index and consequently greater homogeneity of the lens substance. On the contrary, the lens substance becomes less homogeneous, and the hypermetropia is due to diminution of the convexity of the anterior surface of the lens. Accommodation is not affected by anisometropia or even by blindness. Partial or astigmatic accommodation does not exist, so that

there can be no question of an attempt to correct corneal astigmatism by eye-strain. This also disposes of a great deal of rubbish which has been spread on the subject of blepharitis, glaucoma and cataract being caused by astigmatic accommodation. The relation between convergence and accommodation remains unchanged throughout life; there is no increase of effort with advancing years. If there were, presbyopes would act like hyperopes, have convergent squint and accommodative asthenopia. Anatomical studies show in all mammals but monkeys a regular distribution of lens fibers corresponding to a small range of accommodation, while in monkeys and man the fibers are arranged much more irregularly as one would expect from a substance which is to change its form rapidly, frequently and markedly. Accommodation may, theoretically, be due to change in the shape of the cornea. This may exist in birds' eyes. Change in position of the retina is possible in eyes, like those of cephalopods, with a thin sclera. It was formerly assumed in man to explain aphakic accommodation, but the latter does not exist. Displacement of the lens forward or backward is effected in fishes' eyes by means of a band-like muscle (*campanula Halleri*), which also causes lateral displacement and allows a fish to follow an object without moving the eye. Ordinarily the fish has a myopic refraction of 5 to 6 D., as it has to see near objects. There is negative accommodation for distance produced by drawing the lens backward toward the retina. Fishes never become presbyopic. In turtles, positive accommodation is effected by protrusion of the lens through the pupil by an increase of pressure in the vitreous.

P. H. F.

REFRACTION AND ACCOMMODATION.

REPORT OF A CASE OF CYCLITIS WITH A RADICAL CHANGE IN THE REFRACTION.—ELWOOD, CALVIN R., Menominee, Mich. (*Ophthalmic Record*, April, 1907). A case is reported of a woman with cyclitis, with descemitis, who had a minus cylindrical error of refraction which changed completely over to a plus cylindrical error a few months after the disease was cured.

M. B.

INACCURACIES OF TEST LENSES.—BYERS, W. G., Montreal (*Ophth. Record*, July 19, 1907), had occasion to examine the lenses of English manufacture in a test case, and found a large number of the sphericals 1 to 2 mm. off center, others "a way off." and about a dozen cylinders off axis. A test of a new American test set showed even worse conditions and "a truly rotten state of workmanship" in the optical business. About two dozen spheres were off center, some of them about 4 mm. About 25 cylinders were off

from 2° to 5°, while one was off 1° and one 40°. A lense marked — 4.50 was found to be a — 2.25. These findings may explain some results and more failures in our refraction work. They show the necessity of careful tests of our testing apparatus. P. H. F.

A STUDY OF FIFTEEN HUNDRED RETINOSCOPIC TESTS UNDER A CYCLOPLEGIC, WITH SPECIAL REFERENCE TO THE AXES OF ASTIGMATISM AND ACCOMPANYING SYMPTOMS.—AYRES, W. McL. (*Ohio State Medical Journal*, June 15, 1907), has made a study of a large number of refraction cases by the retinoscopic test and classified them very carefully with reference to the axes of astigmatism. From his observations he has drawn a number of interesting conclusions. He notes the possibility of the connection between the monocular asymmetry frequently found in which the deviation was on the right side, and the use of the right hand, also the probable relation of facial and orbital asymmetry to asymmetry in the axes of astigmatism, and cites several authorities holding similar opinions. The writer concludes with stating some impressions received as to the causation of certain kinds of headache, neurasthenia and other sickness by various kinds of ametropia. M. D. S.

THE RELATION OF INCORRECT AND CORRECT REFRACTION TO SYSTEMIC DISEASES.—GOULD, GEORGE M. (*American Medicine*, July, 1907), emphasizes in his usual manner the systemic effects of eye-strain, cites 50 examples, and says all the cases described are from prominent ophthalmologists. He gives the prescription with which he found the patient, and his own, and shows relief from numerous symptoms, as headaches, nausea, "torpid liver," constipation, tachycardia, anorexia, blepharitis, styas, conjunctivitis, subconjunctival hemorrhage, drowsiness, insomnia, nervousness, dermatitis, etc. M. D. S.

THE RELATION OF EYE-STRAIN TO CHRONIC HEADACHES.—TOMS, S. W., Nyack (*Jour. Am. Med. Assn.*, March 23, 1907), notes that headaches may be due to faulty accommodation, notably premature presbyopia, muscle imbalance, or ametropia, and that they are often absent when vision is defective. Intercurrent disease or nervous stress may determine the incidence of eye-strain. There is no apparent relation between the amount of strain and the severity of the symptoms. Ciliary spasm is a frequent cause of strain, and the subjects are frequently ignorant of the real nature of their troubles. P. H. F.

HEADACHE AND EYE-STRAIN.—GOULD, GEORGE M., Philadelphia (*Jour. Am. Med. Assn.*, No. 19, 1906), claims that certainly nine-

tenths of all headaches are due to eye-strain. Much digestional (sic), nervous and psychic disease is due to the same cause. Where organic disease is suspected as a factor, eye-strain may have caused the organic disease or at least have caused the headache which is incorrectly attributed to the extraocular condition. These great truths are unfortunately ignored by the text-book writers, the neurologists, "all the stomach specialists in the world," and 99/100 of the oculists. A large proportion of cases of lateral curvature of the spine, of which there are "at the least" 15,000,000 in America, owe their tragedies, in over 90 per cent., to ocular function and malfunction, and may be cured by correction of refraction error, particularly astigmatism, of so low a grade, that great authorities state that it is useless to correct. A case of this sort in a child of 5 was cured by cylinders with the axes at 105°, a defect that produces head tilting and spinal curvature. The peevishness, vomiting of food and ill health generally disappeared, as did the head tilting and the "incipient spinal curve." Gould shudders to think what would have happened to this child and what would have been its life history had it fallen into the hands of the ophthalmic surgeon. (Probably another Biographic Clinic Rev.) P. H. F.

A UNIQUE CASE OF EYE-STRAIN.—WOOD, P. R., Marshalltown, Iowa (*Jour. Am. Med. Assn.*, Jan. 5, 1906), is a progressive disciple of the newer ophthalmology. He reminds us that 25 per cent. of all civilized people suffer from conditions dependent on ocular malfunction and clinically described as eye-strain. If headaches and systemic disturbances of a digestional and psychic character, unrelieved by drugs, were referred to the ophthalmic surgeon, more satisfactory results would be attained. As demonstrating (!) that eye-strain leads to invalidism, ignorance, pauperism and crime, statistics show that 40 per cent. of Berlin school children have refractive errors. Wood reports the case of a girl of 10 suffering from a group of symptoms "easily recognized as being of ocular origin, viz., nervousness bordering on hysteria, melancholia, indigestion, headache, etc.," and, in addition, enuresis nocturna. After correction of hyperopia with astigmatism the more aggravated symptoms gradually lessened in severity and disappeared in six months. A law requiring the examination of children's eyes and the correction of refractive errors before they are permitted to enter school would mean much in health and happiness. P. H. F.

A CASE SHOWING INCREASE OF HYPEROPIA DURING MARKED GLYCOSURIA.—SAUNDERS, ROBERT RITCHIE, Philadelphia (*Ophthalmic Record*, June, 1907). The patient was a lady of 60 years

who manifested from 1901 to 1903 a hypermetropia which averaged in each eye about 2 dioptries. She then developed symptoms of glycosuria and about the same time the hyperopia increased to $4\frac{1}{2}$ diopters. Appropriate treatment and diet reduced the amount of sugar in the urine and within a month's time the hypermetropia went back to its original amount. M. B.

ON THE RELATIONS BETWEEN THE INEQUALITY OF THE PUPILS AND IRREGULARITY OF REFRACTION.—FRANKEL (*Ann. d'Oculistique*, October, 1906). There is quite a general impression that anisocoria is frequently dependent upon anisometropia, but the author thinks that this opinion does not rest on a solid basis. Extensive clinical researches have convinced him that there is no scientific reason for admitting any relation between these conditions.

G. C. H.

SPASM OF ACCOMMODATION.—KÖNIGSHÖFFER, Stuttgart (*Die Ophth. Kl.*, Jan. 13, 20, 27; Feb. 5, 12, 1907), reports eight cases of spasm of accommodation. The first case was one of true occupational cramp. The second one of subacute occupational cramp; the third, one of chronic spasm; the fourth, one of acute uncomplicated spasm. Case 5 was apparently M., had an hysterical visual disturbance and the Argyll-Robertson pupil. This case showed also that atropin was incapable of at once paralyzing the accommodation. Case 6 was one of hysterical origin. There was a high degree of visual impairment and contraction of the visual field. The amount of visual impairment was fluctuating and was always less binocularly than monocularly. An autosuggestive M. could be induced. There was a reflex nasal factor in the spasm. In Case 7 there was a preceding paresis of the external rectus which suggested a central origin for the trouble, but the physical examination and the course of the case gave no indication of such a lesion. That there was no relation between the existing diplopia and the spasm was proven by the fact that the former disappeared while the latter persisted. The diagnosis was chronic spasm with subacute exacerbations. In Case 8 the underlying cause was an astigmatism which, as it produced a true spasm and not a concomitant one, could be considered to have had its origin in a disposition to reflex spasm excited by a chronic bronchitis. The case belongs to the category of chronic occupational cramp reflexly excited. The spasm subsided after the child had been given glasses, which corrected a high grade mixed astigmatism, to be worn at near work only.

W. Z.

RETINA.

FURTHER OBSERVATIONS ON RETINITIS PUNCTATA.—GEADLE, H., Chicago (*Jour. Am. Med. Assn.*, July 27, 1907), has observed the following forms: Simple punctate retinitis, with small dots, like those first described by Gunn, with normal or but slightly reduced vision, tending to disappear with rest in the course of months. Another form may accompany optic neuritis. A third is associated with retinal hemorrhages, central scotoma, marked impairment of sight, is almost always bilateral, may lead to atrophy, and suggests retrobulbar neuritis. Again, this affection may occur as an atypical form of albuminuric retinitis. In still another variety there is involvement of the chorioid, as shown by vitreous opacity, and hyperemia or exudate in the chorioid. The term retinitis punctata is most frequently applied to a form of atypical retinitis pigmentosa with night blindness dating from youth, and some pallor of the nerve in the cases with diminished sight. The condition may remain stationary or progress rapidly. The entire fundus, but not the periphery, is studded with small round dots, but the macular region is free, and central vision generally good. There may be concentric contraction of the visual field. Several cases occurred in brothers and sisters. In many cases the pigmented figures were seen in the periphery sometimes described as not characteristic of retinitis pigmentosa.

P. H. F.

DETACHMENT OF THE RETINA.—POST, M. H., St. Louis (*Am. Jour. of Ophth.*, May, 1907), reports a number of cases without satisfactory results. Rest in bed, pilocarpin injections, bandage and bichlorid internally were used in the treatment. Dionin was also used without very encouraging improvement.

P. H. F.

EYE-STRAIN AND OTHER DISEASES DUE TO CROSSING, CROWDING AND DAMAGING OF THE RETINAL VESSELS.—GOULD, GEORGE M., Philadelphia (*Med. Record*, June 1, 1907), reverses his usual procedure of damming eye-strain as a cause of intraocular disease and finds that the dammed retinal vessels may be the cause of untold mischief. He has discovered that in the normal eye "the larger trunks of the vessels do not cross over or under each other in their courses," and that if such a crossing takes place there will be an impaired passage of blood within one or both of the trunks concerned. As usual with this author's findings, the damming evidence has not been observed by ophthalmologists. Perhaps because, as he notes, it may be so slight as to produce no serious or demonstrable symptoms. The latter may, however, be so severe as to produce "the greatest and longest suffering and even the life-tragedy

of the patient." He reports the case of a woman in whose eye he found the superior temporal artery describing a small loop close to the disc. From that point on the artery was pale, half collapsed, and evidently carrying but a small quantity of blood. The macula was stippled and "somewhat morbid" in appearance. Vision was 20/xx +; no examination was made of the field of vision, and there was no evidence of a scotoma. A large black lens was provided to be worn constantly, and progressive relief is being procured. Astigmatism, "the greatest of all ocular diseases," is largely dependent upon the pressure of the upper lid (!). A greater tonic-ity would prevent the indentation (sic) by the lid, but then that would be glaucoma.

P. H. F.

RETINAL EXHAUSTION.—EWING, A., St. Louis (*Am. Jour. of Ophth.*, July, 1907), reports a personal experience while engaged in microscopical work which tends to show that a slight diminution of nutrition such as that dependent on a certain amount of hunger may interfere with the exercise of unusually fine and accurate vision. Rest had no effect on the blurring of fine lines in the specimen, nor could accommodation be held responsible, as after a light lunch the writer was again able to see the minutest details which had been obscured. The lenses and the specimen and the light were all fixed quantities. This has been confirmed by visual tests on patients after a meal and when fasting. It is possible that the nerve centers, too, may be affected by hunger, but the fact that the rods and cones deteriorate rapidly soon after death points to the retina as the seat of exhaustion. This may be of practical importance in asthenopia and headache in certain semi-exhausted cases, particularly teachers, bookkeepers, stenographers and school children who suffer toward noon, with an increase of the trouble later in the day.

P. H. F.

NOTES ILLUSTRATING THE PROGRESS OF A RETINITIS OF PRESUMABLE RHEUMATIC ORIGIN.—PATTERSON, J. A., Colorado Springs (*Ophthalmic Record*, April, 1907). Fundus drawings are presented of a woman, aged 53, seen by the author, in whom a central retinal lesion appeared in each eye following an attack of acute inflammatory rheumatism. The retinal lesion presented small ovoid and circular areas of alteration of the pigment layer, these areas being denoted by their tint, being a few shades paler than the surrounding retinal color. These spots in the right eye were grouped in the macular region. In the left eye they surrounded the macula in the form of a ring. The vision was normal and has remained so during four years of observation. The only visual

disturbances complained of were glimmerings, circles and annoying stellate radiations of light about the street arc lamps. During the time she was under observation the number of these retinal spots increased.

M. B.

ON THE OCCURRENCE AND IMPORTANCE OF OPAQUE NERVE FIBERS IN THE HUMAN RETINA FROM THE NEUROLOGIC POINT OF VIEW.—BERNHARDT, M., Berlin (*Berliner klin. Wochenschr.*, 1907, No. 15, p. 422). After a review of the incident literature, Bernhardt reports 5 cases of nervous affections, in which opaque nerve fibers were found in the retina. One occurred in locomotor ataxia, one in a man who had met with an accident, one in a deafmute, suffering from *sclérose en plaques*, two in men who had hysteric attacks. Four cases described by Manz in 1890 were psychopathic, and the anatomic and microscopic examinations published later by Manz were made on individuals psychically diseased. Investigations on new-born children and animals revealed that not the affection itself, but the predisposition to its development, is congenital. According to Eversbusch, the normal lamina cribrosa prevents the spreading of medullated nerve fibers into the retina. Therefore, it will be of importance to study the chronologic relations between the foundation of the medullary sheaths and the development of the septum. The occurrence of opaque nerve fibers in the human retina certainly is an anomaly. Only a larger experience will teach whether it is to be classed with other symptoms of degeneration found in nervous diseases.

C. Z.

GLIOMA RETINÆ: COMPLETE REPORT OF AN EXTENSIVE CASE.—RADCLIFFE, McCLUNEY and GOLDBERG, H. G., Philadelphia (*Arch. Ophthalm.*, March, 1907, xxxvi, 223), report a case of glioma of the retina occurring in a child, aged 2 years. When a year and a half old the child fell, striking the temple, and shortly after the mother noticed a peculiar amber tint in the pupil, which gradually became whiter. On examination a diagnosis of glioma was made and enucleation advised, which was refused. Six months later the eye was enucleated and the orbit eviscerated. The authors give the results of macroscopic and microscopic examination. Patient died about six weeks after operation, and autopsy showed similar growths in the liver, sheath of the spinal cord and optic nerve.

W. R. M.

FUNDUS LESION WITH NORMAL VISION.—BURKHOLDER, J. F., Chicago (*Ann. of Ophthalmology*, January, 1907). The author recommends to beginners in ophthalmology the systematic drawing of the fundus whenever it presents an appearance departing from

normal. He presents for study twelve drawings of the fundus in which the appearances vary from that of choked disc to edema of the retina, all normal vision. He pertinently suggests that these cases show the necessity for the patient's seeking the oculist rather than the optician for the adjustment of glasses. As these lesions were all discovered upon making such tests. M. B.

SCLERA.

TUBERCULOUS SCLERITIS, A COMMONLY UNRECOGNIZED FORM OF TUBERCULOSIS.—VERHOEFF, F. H. (*Boston Med. and Surg. Jour.*, March 14, 1907). The author speaks of the obscure etiology of scleritis and that the view in regard to it most generally held is that the disease is dependent upon a rheumatic diathesis. It has been recognized that scleritis in rare instances may be due to syphilis, and that it may occur in tuberculosis, not being regarded as a tubercular process.

Verhoeff has made some observations in connection with the use of tuberculin in a series of cases that have convinced him that "scleritis is almost always a tuberculous process, that tuberculous scleritis presents certain distinctive features and that in cases in which the proper treatment can be carried out recovery may be confidently expected."

Verhoeff reports 13 unselected cases which came under his charge during his services in the out-patient clinics of the Infirmary and Carney Hospital during the past year.

"The cases were all tested with subcutaneous injections of Koch's old tuberculin, and with the exception of two cases were all admitted to the hospital for this purpose. A positive general reaction was obtained in all cases, and a local reaction in the eye in nine cases. Where the reaction was at all doubtful, the injection was always repeated with a larger dose.

"The control temperatures, which in every case were taken during the twenty-four hours preceding the tests, were always within normal limits. The method finally adopted was to give an initial dose of 0.1 mg., then if necessary 1 mg., and finally 10 mg., at intervals of forty-eight hours. The maximum dose of 10 mg. was necessary in only four cases, but in two others it was used to obtain a local reaction. The lowest febrile reaction obtained was 100.3° in three cases. The highest was 105° in one case, the next highest 104° in two cases. In the other cases the reaction varied between 101° and 103°. The shortest time that elapsed before the height of the reaction was reached was nine hours (105°), the longest, forty-eight hours, and the average time twenty-two hours.

As just stated, a local reaction was observed in 9 cases. In only one of these was the reaction slight and possibly open to doubt. In this case it followed an injection of 1 mg., and was accompanied by a febrile reaction of 100.7°. Forty-eight hours later a second injection of 10 mg. was given which produced marked constituents of which the eye not only showed no reaction, but became decidedly less inflamed and remained so. The local reaction in the other cases consisted in an increased chemosis and congestion of the affected region, and, where keratitis was present, sometimes in an increase in the corneal infiltration. Except in one recent case, the local reaction quickly subsided, leaving the eye more or less improved.

"All of the patients were females, which is in accordance with the established fact that scleritis is more common in their sex. The youngest was aged 11 years, the oldest 46 years, and the average age was 26 years. During the time I saw them the scleritis was active in one eye only, but in three cases there were corneal opacities in the other eye, which, judging by their appearance and by the statements of the patients, were due to a previous inflammation of the same nature. With the exception of one case, the patients were well nourished and apparently in good health, aside from the ocular trouble. Two of the patients stated that they had formerly suffered from rheumatism, possibly tuberculous arthritis. A thorough physical examination was made in each case, but evidences of tuberculosis in the lungs or elsewhere were made out in only three cases. One of these was a child, 11 years of age, who showed enlarged cervical glands and some signs of pulmonary involvement, but no tubercle bacilli in the sputum. The second case, aged 28, gave evidences of an old process, probably healed, at the apex of the right lung, while the third case, aged 39, showed slight signs of incipient tuberculosis at the apices of both lungs. In the latter case there was no definite reaction to tuberculin in the eye, and during the general reaction the patient complained of severe pains in the mediastinum. There was a definite family history of tuberculosis in only two cases. One of these was the child just referred to, whose twin sister and both of whose parents had died of pulmonary tuberculosis. In the other case the father died of Addison's disease at the age of 60 years, while a brother, who had suffered from Pott's disease in early childhood, was attacked by scleritis at the age of 15 years, which involved first one and then the other eye.

"The cases were all such as are commonly met with and conformed to the classical description of anterior scleritis. In two of the cases the inflammation was apparently more superficial than in

the others and would have come under the arbitrary classification of episcleritis. All of the cases showed more or less definite nodules and thus presented what is sometimes distinguished as the nodular form of scleritis. During the subsidence of the affection, however, after the nodules had disappeared, the diffuse form was often simulated, so that it is probable that there is no real distinction between the two forms. The nodules of scleritis seldom merit the name, since they most often appear simply as elevated areas in the sclera. They usually reach a considerable size and are situated at some distance from the cornea, most often, perhaps, where the anterior perforating vessels enter the globe. In addition to these larger well-known elevations, I have frequently noticed the occurrence of much smaller nodules which are situated beneath the conjunctiva and form the centers of small congested areas. At some period of the disease they were observed in all except three of the cases here reported. They vary from less than one to several millimeters in size. The smaller ones are almost perfectly translucent, the larger are apt to be more or less opaque and yellowish in color. They usually occur in the vicinity of one of the larger elevations, sometimes immediately upon it, but are not necessarily confined to this situation. Sometimes they occur near the limbus, where they may be mistaken for phlyctenules, but I have never seen them exactly on the limbus. Frequently they border on a small blood vessel. When an attempt is made to excise one of them, a small white spot is left behind in the sclera.

"The histological examinations which I made of these nodules, in four cases, showed that the essential lesion was a focal proliferation of epithelioid cells, among which an occasional giant cell occurred, surrounded by an infiltration of lymphoid and plasma cells. The vessels in the neighborhood showed perivascular infiltration with chronic inflammatory cells and the subepithelial tissue showed a similar infiltration in a greater or less degree. Caseation was entirely absent. Numerous sections, specially stained for the purpose, were unsuccessfully examined for tubercle bacilli.

"In all except two cases interstitial keratitis was present at the time the patients came under my observation, and in three cases there was a sluggish iritis that had led to posterior synechiæ. The keratitis, at least when in an active stage, seemed always characteristic. It consisted of a deep infiltration of the cornea, usually but not always extending out from the sclera on the affected side, which showed one or more punctate areas of greater density. Sometimes a punctate area was observed first in the clear cornea and was afterwards surrounded by a hazy zone which increased or decreased ap-

parently in accordance with the severity of the process. The variation in the density of the diffuse infiltration was always more apparent than in that of the punctate areas.

"The scleritis often cleared up more rapidly than the keratitis, or at least appeared to do so, so that the eye sometimes showed simply a marked corneal infiltration with a slight circumcorneal injection. Such a condition, seen for the first time, might easily be mistaken for primary keratitis. In none of my cases has the corneal opacity entirely disappeared, but the extent to which it has cleared in some of them is remarkable and in all it has decreased in density. A considerable residual opacity, however, is, of course, to be expected in all cases of long standing."

In the treatment of these cases one of the chief difficulties encountered was the lack of adequate facilities in either hospital for giving the patients a sufficient supply of fresh air. The patients were directed to give up work, including household duties of any kind, and for the first two or three weeks to rest and take as much nourishment as possible. At night they slept in rooms with the windows open, and during the day reclined in couches or hammocks in the open air, taking care to be well protected from exposure to cold. Later, when the ocular condition improved, a certain amount of exercise was permitted. Each patient kept a record of her temperature and weight and any other details of importance. Twice weekly the patients visited the clinic where they received injections of Koch's old tuberculin. Each at first received a dose considerably below that to which she had reacted, and this was slowly increased so long as the eye did not react or the injection was not followed by a rise in temperature. The highest dose reached was 10 mg. in one case. Under this treatment all four of the patients steadily gained in body weight and the ocular inflammation in each case entirely subsided within six weeks to two months. The remaining four cases have not yet been under treatment sufficiently long for the beneficial effects to have become clearly manifest.

At least three of the patients several times showed exacerbations during the menstrual periods, which is usual, I believe, also, in other forms of tuberculosis. This no doubt explains why scleritis is sometimes attributed to menstrual disturbances. Possibly it explains also why scleritis is more common among females, since the lowering of the resistance during menstruation no doubt increases the likelihood of metastases. No local treatment was employed in any of the cases other than the use of atropin as a collyrium to prevent iritic adhesions and to make the eye more comfortable.

N. M. B.

SINUSES.

THE RELATION OF DISEASE OF THE NASAL ACCESSORY SINUSES TO DISEASE OF THE EYES.—BRAWLEY, F. E., Chicago (*Jour. Am. Med. Assn.*, March 23, 1907), discusses a class of cases characterized by headache, usually unilateral, increased by use of the eyes, and without marked evidence of nasal abnormality. There is no question of a suppurative process in the accessory cavities. Glasses may for a time relieve all or a greater part of the symptoms. The frontal and ethmoidal cells are chiefly involved. Grippe is the usual cause. There is often insufficiency of accommodation and convergence, neuralgic pain and tenderness at the inner orbital angle. The whole condition is due to interference with the free exchange of air between the nasal chamber and the sinuses. Amputation at the end of the middle turbinal, sufficient to uncover the hiatus, will always bring about a cure.

P. H. F.

CASE OF BILATERAL, PAINLESS DILATATION OF THE FRONTAL SINUSES DUE TO DEATH OF THE LINING MUCOUS MEMBRANE.—DUNN, JOHN, Richmond, Va. (*Arch. Ophth.*, March, 1907, xxxvi, 212), gives the history of a case of progressive enlargement of both frontal sinuses occurring in a man, aged 23. Several years previously he suffered with a severe pain back of the right eye which was followed by a sudden discharge of pus from the right nostril and relief from pain. The discharge lasted a few days, and there had been no return. The following year enlargement began over the frontal sinuses which gradually increased. Examination showed a marked, hard, bony protrusion over the sinuses without any signs of inflammation. Intranasal structures were normal and no discharge. Operation showed the external bony plate of the sinuses to be excessively thin. The sinuses were lined with a dry, atrophic, grayish white membrane. The naso-frontal ducts were open. Dunn considers the thinning and dilatation of the sinus walls to be secondary to the atrophy of the lining membrane, with an added increase of pressure within the sinuses from blowing the nose. Several months after the operation the patient thought the bulging of the forehead was still progressing.

W. R. M.

A CASE OF EMPYEMA OF THE SPHENOIDAL SINUS WITH EYE SYMPTOMS AND REMARKS ON THE ANATOMY OF THE SPHENOIDAL SINUS.—CUNNINGHAM, J. H. B., Belfast (*Ztschr. fuer Augenheilkunde*, April, 1907, No. 17, p. 345). A man, aged 50, had, two years ago, diplopia for about four weeks, with fetid discharge from left nostril, vertigo and pain in left side of forehead and temple, and slight inflammation of left eye. Three months ago diplopia

returned, preceded by rhinorrhea. Cunningham found the left eye slightly prominent, no chemosis, V. = 6/ix in both, crossed diplopia, corrected by prism 4°, slight paresis of left rectus externus, slight but marked papillitis of left eye. Visual fields concentrically contracted, especially L. After removal of polyps, pus was found at the region of the left sphenoidal sinus, which was irrigated through a sinus canula. After three weeks the diplopia had disappeared. Each time the irrigations were followed by improvement of the other symptoms. Finally the nasal border of the optic disc had become indistinct, the temporal half somewhat pale; V. = 6/ix. The exophthalmus and subsequent diplopia were apparently due to an inflammatory swelling of the retrobulbar tissue, propagated either directly through the bone or the lymph current. Optic neuritis is a rare complication.

A very good drawing of a sagittal section through the skull shows the anatomical relations of the sphenoidal sinus. The position of the ostium explains the difficulty of catheterization of the sinus. After removal of the middle turbinated body it is still covered by the upper one and the posterior portion of the ethmoidal bone.

C. Z.

SYMPATHETIC OPHTHALMIA.

PREVENTIVE TREATMENT OF TRANSFERRED (SO-CALLED SYMPATHETIC) OPHTHALMIA.—OLIVER, C. A., Philadelphia (*Jour. Am. Med. Assn.*, July 27, 1907), pleads for reforms in the construction of factories and shops, compulsory employment of protective devices by workmen, personal cleanliness, prompt treatment of ocular injuries, immediate attention to first aid, and the best possible instrumental equipment of hospitals and dispensaries. Direct causes are to be reached by increased certainty in the use of the x-ray for localization, the prompt removal of foreign bodies from the interior of the eye, early enucleation of hopelessly injured globes, better preparation of the patient for aseptic operation, continuance of control therapy, and better facilities for keeping the patient under prolonged observation.

P. H. F.

ANATOMIC CHANGES ("UVEITIS PROLIFERATIVA," FUCHS) IN THREE CASES OF OPHTHALMIA SYMPATHETICA.—BROWN, E. V. L., Chicago (*Arch. Ophth.*, March, 1907, xxxvi, 173), by a clinical and microscopical study of three cases of sympathetic ophthalmia, confirms the published reports of Fuchs, who described a proliferative uveitis, which he found constantly present in diseased eyes, which cause sympathetic inflammation of the fellow eye. Fuchs found this to be an infiltration, within the uvea, of lymphocytes, giant

cells and epithelioid cells, and his microscopical diagnosis, in 24 cases, was confirmed by the clinical histories; all the cases showing a sympathetic ophthalmia. Brown gives the clinical histories and pathological findings in three cases and agrees with Fuchs that there is present a cell proliferation within the uvea in the exciting eye. His cases showed a relation between the severity of the inflammation in the sympathizing eye and the intensity of the proliferative uveitis. The author reviews similar findings in literature, taking "one thing only as an absolute and final criterion of uveitis proliferativa, namely, a proliferation of epithelioid cells in clusters, or singly, within the confines of the uvea in eyes which have caused actual sympathetic inflammation of their fellows."

Brown makes a differential diagnosis between proliferative and infiltrative uveitis of sympathetic ophthalmia and that of syphilis and tuberculosis, and in summarizing the cases noted by Fuchs and others he states that "proliferative uveitis is in no way pathognomonic of sympathetic ophthalmia," because: "1. Typical sympathetic inflammation occurred in one case without any proliferative uveitis in the exciting eye. 2. Typical proliferative uveitis was present in one case presenting only symptoms of sympathetic irritation of the fellow eye. 3. Typical infiltrative uveitis with epithelioid-cell proliferation occurred in one case of spontaneous iridocyclitis. 4. Typical infiltrative uveitis, though without epithelioid-cell proliferation, occurred in three cases of 'serous' iridocyclitis. 5. Only one case of proliferative uveitis absolutely uncomplicated by fibrino-plastic uveitis has been reported, and the sympathizing eye of this case showed 'some synechiæ.' 6. Epithelioid-cell proliferation has been specifically noted in but one of the ten sympathizing eyes studied. 7. Epithelioid-cell proliferation is not found in the late stages of sympathetic inflammation."

From a study of his three cases, Brown corroborates the findings of Fuchs, that "proliferative uveitis is the essential anatomic condition present in the eye which causes sympathetic inflammation of its fellow."

W. R. M.

CRITICAL REMARKS ON THE HISTOLOGICAL DIAGNOSIS OF SYMPATHETIC OCULAR INFLAMMATIONS ACCORDING TO FUCHS.—RUGE, Dortmund (*Graefe's Arch*, lxx, H. 1, December, 1906; see also Fuch's articles in B. lviii and lxi, also Ruge's original art., lvii), gives the following to convey the difference which exists between the author's and Fuchs' views concerning sympathetic inflammation: According to Fuchs, a perforating infected injury to the eye can cause: 1, acute purulent inflammation (ophthalmica

septica); 2, exciting inflammation. The two together: mixed infection, the result of simultaneous infection with the inflammatory excitors of both of these types.

According to Ruge, perforating infected injury can cause: 1, acute purulent inflammation; 2, primary chronic fibrino-plastic inflammation, the latter occurring in two forms: (a) simple fibrino-plastic. (b) exciting inflammation, mixed infection resulting from simultaneous infection with inflammatory excitors of both types, I and II.

Ruge believes, with Fuchs, that of the three kinds of cells found, round, epithelioid and giant, the latter are found in 50 per cent. of all exciting eyes. He states that in a vast majority of cases where epithelioid cells were found giant cells were present. If they were not found, it would not be conclusive that they were not present, as they might be hidden by the round cells, and that a given case was not one of exciting inflammation because of their non-discovery.

As to round cells, he found these always present in traumatic fibrino-plastic inflammation. He denies that epithelioid and giant cells are pathognomonic of exciting eyes. He says that he is far from asserting that it is impossible to differentiate a high-grade exciting inflammation from a low-grade chronic fibrino-plastic uveitis following trauma, but believes that there are such gradations between these extremes that border-line cases exist that can not with certainty be differentiated.

On the whole, Fuchs' findings in the iris correspond with the author's, only he is unable to confirm the observation of the protrusion of the cell proliferation beyond the plane of the iris.

He does not consider characteristic inflammation that the chorioidal changes are to be found principally at the posterior pole, as he has at times found that region entirely free, whereas anteriorly it was strongly infiltrated. As to the absence of superficial exudate in the iris and ciliary body, the author believes, with Schirmer, that there is a pure sympathetic plastic exudate without denying that the plastic exudate in many cases is to be traced to mixed infection.

W. Z.

SYMPATHETIC OPHTHALMIA THIRTY-SEVEN YEARS AFTER THE TRAUMATISM.—SULZER (*Annales d'Oculistique*, February, 1907). The patient's left eye was atrophied as the result of a wound with scissors in early childhood. The globe was reduced to half the normal size, but was not inflamed, painful or tender to the touch. In the right eye there were iritis, deposits upon Descemet's membrane and cloudiness of the vitreous. Later there was a periphere

patch of exudative choroiditis. The atrophied ball was enucleated and the case was treated with atropia, quinin and subcutaneous injections of cyanid of mercury, and the "sympathized" eye was restored to normal conditions.

The sympathetic character of this case seems very doubtful, but, as the author says, any atrophied globe, even if painless, may become dangerous at any moment, as the very fact of the atrophy indicates the former existence of iridocyclitis, and it is well to give the patient the benefit of the doubt.

The author concludes that "enucleators" are not so often in the wrong as Wecker has maintained.

G. C. H.

TOXICOLOGY.

ON THE ACTION OF CANTHARIDES.—KOWALENSKI, R., Berlin (*Deutsche Medizinische Wochschr.*, 1907, No. 15, p. 593), saw bilateral acute catarrhal conjunctivitis with chemosis, iritis and acute nephritis in a man who, for ten days, had been wearing a cantharides plaster behind the right ear. The iritis of both eyes is attributed to a diffusion of the toxic agent from the conjunctival sac, into which it was apparently carried by the handkerchief of the patient, carelessly used for drying the serous fluid accumulated behind the ear, and wiping the face and eyes. Kowalenski's opinion is strengthened by his experiments on rabbits. Instillation of the serous fluid, produced by the plaster in man, into the conjunctival sac, or rubbing the conjunctiva with the plaster, created injection of the palpebral conjunctiva. The insertion of a piece of emplastrum cantharidis perpetum, 2 mm. square, or a piece of the ordinary plastr. canth., of the size of a pin's head, caused a violent catarrhal conjunctivitis with pasting of the lids, and, after 24 hours, iritis with exudations into the pupillary area and posterior synechiæ. The cloudiness of the cornea on the first day disappeared on the second. The synechiæ were torn by atropin and the affection healed in a week. In contrast to the scanty analogous experiments on animals so far known, the severe iritis was not due to an extensive ulcer of the cornea, but to the toxic action of the cantharidic preparations propagated from the conjunctiva. Thus cantharides must be considered as a very dangerous remedy, on account of their toxic action on the eyes, and are best entirely discarded, as we have other means to secure the healing and anodyne effects attributed to them.

C. Z.

BLINDNESS FROM ATONYL, METHYLALCOHOL, BISULFID OF CARBON AND FELIX-MAS.—V. KRÜDENER, H., Riga (*Ztschr. fuer Augen-*

heilkunde, xvi. *Ergänzungsheft*, p. 41). A man, aged 38, received, on account of nervous symptoms, from a physician, 10 injections of 16 per cent. atoxyl (anilid metarsenite). He experienced a very agreeable stimulating effect and continued it against medical advice, so that about 50.00 atoxyl were used within seven months. After transient obscurations, his sight commenced to fail considerably. The optic nerves were pale, visual fields contracted for white, red and green. Despite treatment with baths, diaphoresis, electricity, iodine, mercury, etc., total blindness of left eye ensued after three months: R. V. = 1/x, with contraction of visual field to the fixation point. Optic atrophy was complete on both sides. The very acute course was remarkable and suggested a direct damage to the nerve fibers or rather ganglion cells. Whether it was due to arsenic or anilid is left undecided, as both substances are poisonous.

Since the population of the Baltic provinces discovered in methyl alcohol a similar action to that of ethyl alcohol, intoxications have become more frequent. Five cases are mentioned, one with great diminution of sight and one out of four cases of total blindness for gray-white atrophy are given in detail. Two types of poisoning by methyl alcohol may be distinguished: 1, under the aspect of retrobulbar neuritis, still amenable to treatment; 2, primary degenerative atrophy. Individual resistance seems to play an important part, as illustrated by v. Krüdener's first case. While the patient had difficulty in breathing directly after drinking a glass full of methyl alcohol, after three days' debauching in alcohol with three friends, they, although they took the same doses, remained perfectly healthy.

A man, aged 33, who for years worked in a chemical factory, suffered from headaches for the last three months, and his sight commenced to fail more and more during the last two weeks, which he attributed to bisulphid of carbon squirting into his eyes. V. both fingers at 10 feet, central scotoma from 15° on. After three weeks treatment V. = 1/vii, when he recommenced his work. In a week he returned with severe headache and beginning atrophy of the optic nerve. Bisulphid of carbon is manufactured in retorts from which, although they are closed, a very strong odor emanates.

Central scotoma and impairment of vision with sluggish reaction of the dilated pupil was observed in a woman who had taken filix powder and extract filicis $\bar{a}\bar{a}$ 2.00 and then two tablespoonfuls of castor oil. The ophthalmoscope disclosed no alterations of the fundus, and the affection healed after a few months. Some physicians are opposed to castor oil after the injection of filix mas. as an emulsion is formed, which is more readily absorbed and may lead

to general disturbances. (However, Lewin and Guillery, in "The Action of Drugs and Poisons on the Eye," p. 921, call attention to the possibility that these may be due to the action of poisons produced by the parasites under the influence of the anthelmintic.—Reviewer.) A dog (setter) who received 3 to 4.00 extract. filicis for the cure from a tenia died two hours later. Filix mas paralyses, according to Straub and Stuelp, the striped and smooth muscles, and the visual affections are due to circulatory disturbances in the central retinal artery.

v. Krüdener quotes from C. Stromberg, that fifteen soldiers who drank Kuntzens-Balsam, containing about 50 per cent. methyl alcohol, died and three were afflicted with severe amblyopia.

C. Z.

ON SUBJECTIVE PATHOLOGIC COLOR SENSATIONS IN INTOXICATIONS.—HILBERT, R., Sensberg (*Klin. Monatsblätter fuer Augenheilkunde*, xlv, Mai-Juni, 1907, p. 518). Subjective pathologic color perceptions have been observed in psychoses (paresis, tabes, epilepsy), diseases of the nervous apparatus of the eye, after cataract operations, as chromatic double sensations, after infections and organic diseases, as genuine chromatopsias without evident causes and may be brought about by toxic substances. Hilbert gives, from literature, a very complete review of pathologic color sensations due to intoxications:

Erythropsia after eating seeds of hyoscyamus niger. The author saw it after instillation of duboisin, Hawkes after scopolamin. It seems that the similarly acting solanea (atropin, duboisin, scopolamin) may produce erythropsia. In a case of de Schweinitz, red and orange visions were caused by tobacco, which also belongs to the solanea, in a case of Muntendam by 3.00 of chinin.

Kyanopsia was observed in acute alcohol intoxication, violet vision after hashish and intoxication by a Japanese fungus.

Most frequently xanthopsia was seen as a symptom of intoxication: after use of chromic acid on the feet, salicylate of sodium, carbonic oxid, poison of serpents, nitroglycerin, in chronic alcoholism and simultaneous tobacco amblyopia, digitalis, phenacetin, iodoform, santonin, picric acid. In a case of siderosis bulbi Bettremieux attributed xanthopsia to an intoxication. Hilbert, however, considers it more natural to explain it by the rust staining of the refracting media. A substance which produces green vision has not yet been found.

C. Z.

TRACHOMA.

THE FREQUENCY OF TRACHOMA IN MEXICO AND ITS PROPHYLACTICS.—DR. MANUEL URIBE Y TRONCOSO, Mexico (*Anales de Oftalmologia*, April, 1907). It has been the unanimous opinion of all oculists in Mexico that trachoma is rare throughout the Mexican Republic, and that this rareness is not due to the height over the sea level. With the object of a better study of the frequency of trachoma in the republic, several reporters have been appointed to make statements at the next meeting (third annual) of the Mexican Ophthalmological Society.

He has been much surprised by the assertion of Dr. L. Chavez, who had noticed in a few months, from July of last year, 60 cases of trachoma among 2,000 patients in the "Hospital de la Luz." The author has observed nothing like that in his consulting rooms at the "Consultorio Central de la Beneficencia Publica," for among 3,000 patients observed in two years he has found only 7 with trachoma, of whom nearly all were native Indians.

This same thing observed by Uribe has been observed, according to their statement before the Ophthalmological Society, by Drs. Ramos, Lopez, Chacon and Montano, and he thinks that Dr. Chavez has by chance met with a series of cases.

The author concludes that there does not exist at present an epidemic of trachoma in the capital. He is of the same opinion as Dr. Chavez that the rareness of trachoma in the republic is due to the slight immigration, and he also agrees with him about imposing severe measures on immigrants so as to prevent the introduction of trachoma among us.

J. DE J. G.

TRACHOMA IN MEXICO.—DR. LORENZO CHAVEZ, Mexico (*Anales de Oftalmologia*, March, 1907). He ends his lengthy paper with these conclusions:

1. Trachoma has always existed in Mexico, in a sporadic form, and has been diagnosed by our professors and companions in the Ophthalmological Hospital since the year 1876, when the hospital was founded.

2. It has been very rare, for up to the middle of last year, in more than 24,000 eye patients, the average of trachoma has been 5 per thousand.

3. It is now universally acknowledged that a great height over the sea level does not prevent the development of trachoma; we must, therefore, attribute the rarity of trachoma in Mexico to other causes.

4. The real causes of this rareness have been the scarcity of immi-

grants afflicted with trachoma and the slight density of the population.

5. In the middle of last year the number of trachoma patients in the Ophthalmological Hospital began to increase, owing in great part to an epidemic in an orphan school.

6. The notable increase in the density of the population and the immigration of many Syrians afflicted with trachoma are the causes which have produced the increase of trachoma in Mexico.

J. DE J. G.

TREATMENT OF TRACHOMA.—BORDALEY, JAMES, JR., Baltimore (*Ophthalmic Record*, July, 1907). The author is still convinced of the efficacy of his boric acid friction treatment of trachoma. He now gives Priestley Smith credit with having been the first to advise this simple operation. It consists of dusting boric acid powder over the everted lids and rubbing them with a cotton wound match stem; this is also carried well into the fornices. This treatment is carried out daily for two weeks and then every other day for ten days, and then as is found necessary to keep the process of relief or cure from coming to a standstill. The longest time that he has found it necessary to continue the friction was ten weeks. The treatment does not cause much pain, and what little there is subsides in five or ten minutes; therefore, both eyes can be treated at the same sitting. He claims that this treatment brings about a cure with almost no scarring and that old cases of pannus and corneal scarring are restored almost to the normal. In some of his cases, he says, it is almost impossible to tell that trachoma was ever present, and that in others absolutely no trace of the disease remains.

M. B.

ON THE TREATMENT OF TRACHOMA.—GUENOD (*La Clinique Ophthalmologique*, May 25, 1907). The writer states that Tunis, with Egypt and the north of Africa in general, give a most prolific habitat for trachoma and offer a vast field for research in the special domain of granular eye troubles, already so much investigated and as yet so little understood. Guenod observes in his paper he has nothing new to offer in the way of etiology of the affection. The research work at the Pasteur Institute at Tunis by Guenod and Nicolle has resulted in the successful inoculation of monkeys with trachoma and has also enabled those observers to study the disease in its primary stages now so little known; as to what result this research will give it is as yet not possible to say.

.During the past ten years Guenod has treated more than ten thousand cases of granulations, and nearly every method of treat-

ment which had been extolled has been tried at his clinic. This is especially true of deep scarifications and careful curettage as surgical measures, with sulphate of copper as a medical adjuvant. But it should be said that the length of the treatment required is regretful and the disagreeable return is always to be feared, especially with the effect upon the cornea. Since 1902 Guenod has been able to produce a marked amelioration in the disease by the systematic employment of subconjunctival injections. So far Guenod has been unable to find in the literature any mention of this treatment in trachoma, save in a paper of Cetnarowicz, who alludes to its use by Dransart in the *Therapeutique Oculaire* of Darier.

Those who systematically employ subconjunctival injections of cyanid of mercury, for example, in inflammation of the cornea and of the uveal tract, or of the deep membranes, will have observed that sometimes after the injection—from fifteen days to three weeks—a small cicatricial spot under the conjunctiva is formed at the point penetrated by the hypodermic needle. And Guenod, believing that he could utilize this sclerogenous effect in modifying the granular tissue, put the treatment by subconjunctival injections into use systematically with marked benefit, and proved his theory.

Guenod's method is as follows: After the instillation of a few drops of cocain, a deep local anesthesia is obtained by means of some cocain drops subconjunctivally administered at the level of the superior cul-de-sac. Then two or three long and deep incisions, after the mode of Abadie, nearly parallel with superior border of the tarsal cartilage; then the granulations are curetted. This process is repeated at the inferior cul-de-sac. Then the subconjunctival injections of cyanid of mercury, 2-1000, with a few drops of 10 per cent. dionin, are made. This is limited to the tarsus by throwing in a minute quantity of the solution through three or four punctures, with one or two injections under the bulbar conjunctiva; then one or two subconjunctival injections of the solution are made at the level of the inferior cul-de-sac. There is very little pain from this if the cocain has been carefully injected. An occlusive dressing is applied for twenty-four hours after the application of iodoform ointment between the lids. Swelling of the lids and conjunctiva occurs by the following day. B. E. F.

GRANULOSIS AND INJURY.—AUGSHEIM (*Wiener Medizinische Wochenschrift*, May 11, 1907). The author is of the opinion that in a trachomatous eye an ulcer is the result of an injury.

There are a number of individuals afflicted with trachoma who were able to perform their usual work up to a time that the eye

received a slight injury, such as might be produced by a foreign body, and then the patient became incapacitated for further work, and a severe inflammation of the eye ensued. The examination then shows a severe acute trachoma without any trace of an injury. In 33 per cent. of the cases examined the writer was able to prove that the cause of a latent trachoma being changed to an acute one was due to an injury to the eye.

The author arrives at the following conclusions: 1. Pannus trachomatosus is caused by an affection of the corneal epithelium with the virus of trachoma. 2. Trachoma diminishes the resistance of the cornea to trauma. 3. A trauma can by irritation change a latent trachoma into an acute one. 4. Trachoma diminishes the susceptibility of the cornea towards infection with the pneumococcus, and if an infection has already taken place the virulence of the cocci is diminished.

J. G.

TUMORS.

A CASE OF EPITHELIOMA OF THE CHORIOID.—WEEKS, JOHN E., New York (*Ophthalmic Record*, April, 1907). A woman of 62 years gave a history of being treated for iritis and of visual failure, supposedly due to immature cataract. When seen by the author the patient was complaining of pain in her left eye; this eye was slightly injected, the anterior chamber was shallow, the pupil of moderate size and irregular from posterior synechiæ, the lens was completely opaque and tension elevated. Transillumination showed a dark area in the lower outer quadrant. Vision equalled perception of light; projection faulty above and to the nasal side. The diagnosis was made of an intraocular growth and enucleation advised. After the eye was removed the growth was found to involve the outer inferior anterior portion of the chorioid and the ciliary body. It pressed against the crystalline lens and projected into the vitreous, reaching the median line. It appeared to be free from excess pigment. The retina was detached throughout about one-half its extent. The growth developed from the chorioid, apparently from the layer of large vessels. The arrangement of the cell masses suggests the so-called alveolar sarcoma.

M. B.

PRIMARY MELANOTIC SPINDLE-CELL SARCOMA OF THE CORNEAL LIMBUS.—VEASEY, C. A., Philadelphia (*Ophthalmic Record*, June, 1907). A man of 47 years had noticed a small brownish spot just to the temporal side of the sclerocorneal junction for about twelve years. It then began to grow and increased rapidly in size during seven weeks, when he consulted the author. It was found to occupy about two-thirds of the corneal surface and extended 1.5 mm. into

the sclera. It was firmly attached to the underlying ocular structures, and was dark-brown in color. The apex was ulcerated and bled on the least manipulation. The iris was of good color and the anterior chamber unaffected. The eye was enucleated and examined microscopically by Dr. C. M. Hosler. His report is given in full and his diagnosis was a spindle-cell sarcomata. M. B.

PRIMARY SARCOMA OF THE EYELIDS.—ALLING, A. N., New Haven (*Ophthalmic Record*, June, 1907). A child of 7 years during six weeks' time developed a hard tumor the size of a pea underneath the skin, a little below and outward from the left outer canthus, with three or four smaller ones lying on the tarsal plate of the lower lid and one over the outer part of the tarsus of the upper lid. No glandular involvement. During two weeks the growths had increased in size decidedly. They were removed through a skin incision which exposed all of them. The wound healed kindly, but two months later there was evidence of recurrence. They were now known to be malignant, and a month later a more radical operation was done, but the child died shortly after from scarlet fever. The report of the pathologist was that the growths were fibro-myxosarcoma. M. B.

A CASE OF ANGIOSARCOMA OF THE LOWER LID, WITH MICROSCOPIC SLIDE AND PHOTOGRAPH.—CLAIBORNE, J. HERBERT, New York City (*Ophthalmic Record*, June, 1907). A strong, healthy boy, 13 years of age, during two months' time, developed a red tumor the size of a small peanut from the cutaneous surface of the lower lid about 1 mm. below the edge of the conjunctiva, between the punctum and the wall of the nose. It was pedunculated. The tumor was corrugated and bled easily to touch. The eyeball was unaffected. An attempt was made to remove the tumor by abscission without general anesthesia, but was only partially successful. An attempt was made later to abscise the remaining portion, but recurrence of the tumor and a report from the pathologist which showed it to be an angiosarcoma warranted an operation under ether. When the tumor area was freely cauterized deep down into the tissues the part healed in two weeks, leaving a white scar. The histological report of Dr. E. B. Coburn is appended. M. B.

A CASE OF FIBROMA OF THE ORBIT.—KÖNIGSHÖFER, Stuttgart (*Die Ophth. Klin.*, Feb. 5, 1907). The patient, a man, 19 years of age, had, since 4 years of age, a gradually increasing exophthalmus of the left eye, with downward and outward deviation. There was no history of disease or injury. V. = finger counting at 4.5

m. The fissure was widened and the lids and brow protruded greatly. The superciliary ridge was 1.5 cm. higher than its fellow. On drawing the lower lid away, the conjunctiva of the cul-de-sac bulged and palpation showed that behind it there was a firm tumor coming from the depths of the orbit. The downward and outward movements of the globe were somewhat limited. The lower orbital ridge was displaced downwards and was roughened. The skin and conjunctiva were movable. The other symptoms were those of an orbital tumor. The iris, cornea and lens were normal. The pupil was moderately dilated and reacted sluggishly to light, but otherwise normally. There was a low-grade choked disc. There was evidently a hard tumor filling a large part of the orbital cavity outside the muscle funnel and not connected with the walls of the orbit or with the eyeball. The growth was removed through an incision beginning somewhat beneath the internal canthus and curving downwards and outwards to the level of the middle of the outer commissure. On separating the soft parts and tying a large vein the bright red anterior surface of the tumor came into view and was readily shelled out. The eyeball sprung at once into its normal place. The tumor was encapsulated and measured 5.1x3.9 cm. (about the size of a hen's egg). Three weeks later a tenotomy of the external and an advancement of the internal rectus was done. V. was the same as before the operation. Pathologic examination showed the usual picture of fibroma with central softening and secondary degeneration. Endothelioma arising from the lymphendothelium of the adventitia.

The author found but 7 cases in literature and in only one was the tumor so large as in his case. The transition into an endothelioma has, to the knowledge of the author, never before been observed.

W. Z.

EPITHELIOMA OF THE CARUNCLE.—PETIT (*Annales d'Oculistique*, July, 1906), reports a case of this affection which he considers of interest on account of its great rarity and of the non-malignant appearance that it presented. He had made a diagnosis of papilloma. A little tumor, hardly so large as a small pea, was situated directly upon the caruncle. It was grayish and of irregular form and contained several fine hairs, and there was a small ulcer on its edge. It was obtained with scissors and two years later there was no sign of a return. In the absence of definite etiology, the author considers La Grange's division of tumors of the caruncle into two forms to be the most convenient.

1. Tumors of connective tissue origin and, 2, tumors of epithelial

origin. The first are usually found in the semilunar fold and the second in the caruncle.

The connective tissue tumors that have been described are dermoid cysts, fibromas and sarcomas. The epithelial tumors are adenomas and epitheliomas.

Some cases of papilloma have been reported. In one, by Terrien, the tumor, consisting of an agglomeration of little papillary vegetations, recurred after twelve years without transformation into epithelioma, which, Terrien thinks, confirms the view that papilloma is not a variety of epithelial cancer. G. C. H.

ANGIOMA OF THE CONJUNCTIVA.—CASTELAIN (*Annales d'Oculistique*, February, 1907), reports two cases of this rare affection and gives a full bibliography of the recorded cases. The seat of election is the internal angle of the eye in the region of the semilunar fold. The structure of angioma of the conjunctiva is that of angioma in general. In the majority of cases, if not in all, the origin of the disease is congenital.

The symptoms are chiefly of a mechanical nature. Hemorrhage is usually not severe, but Fuchs has reported a case in which the patient nearly bled to death from a very small conjunctival angioma. The evolution is variable. The disease sometimes remains stationary indefinitely and sometimes increases slowly or rapidly. The tumor may disappear spontaneously during the first months after birth, but later there is no hope of such a termination. As to prognosis, angioma of the conjunctiva may generally be considered as a benign tumor of slow growth, though the prognosis may sometimes be more serious on account of the danger of abundant hemorrhage or the possibility of transformation into a malignant growth.

The author considers the methods of choice in treatment to be excision, thermocauterization and electrolysis. G. C. H.

A CONTRIBUTION TO THE CLINICAL AND ANATOMICAL STUDY OF LYMPHOMA OF THE CONJUNCTIVA AND TARSUS.—BASLINI, C., Milan (*La Clinica Oculistica*, May, 1907). A boy, 10 years old, two months before consulting the writer noticed an enlargement of the upper lid. The local examination showed the left upper lid in a condition of ptosis and a swelling of the tarsus. The lid could be only slightly turned up; there could be seen large, red granulations on the conjunctival tarsus. Treatment was removal of the affected conjunctiva and tarsus. The patient made a good recovery.

Clinical Considerations.—The total ablation of the tarsus is not a new procedure. Wood (1903) advised it in certain forms of

chronic trachoma. The Russians are especially partial to it. The upper lid usually reacquires its function through the skin fibers of the levator palpebræ which are not divided in the operation.

Anatomical Examination.—The epithelium of the conjunctiva was in great part lost. The subepithelial connective tissue layer and the superficial part of the tarsus were infiltrated with lymphocytes and young connective tissue cells. Some of the vessels contained no blood. The connective tissue proliferation was less marked in the superficial part of the tarsus. The connective tissue presented numerous young cells in different stages of evolution and the vessels were infiltrated in the adventitia. No mitoses were found. In some sections the connective tissue trabeculæ appeared better developed and extended by means of outshoots into the tarsal conjunctiva, circumscribing large spaces filled with numerous lymphocytes and a few young connective tissue cells. In some parts of the trabeculæ could be seen hyaline degeneration. The lobules of the Meibomian glands were surrounded and the lobules appeared reduced in volume.

R. H. J.

VISUAL FIELDS AND VITREOUS.

A CASE OF COLORED SCOTOMA.—HILBERT, R., Sensburg (*Centralbl. fuer Augenheilkunde*, 1907, Mai, p. 141). The left eye of a man, aged 50, showed the remnants of chorioretinitis, with V. = 20/lx. Optic disc white as chalk, its borders very sharp, retinal vessels thin, pigment epithelium lacking, so that the chorioidal vessels were clearly seen. In artificial light the patient saw a round yellow spot in the center, half transparent, half opaque, which waxed with the fixation of more remote objects. This case deviates from the 17 cases of colored scotoma collected by Hilbert in a former paper, in that the scotoma was described as transparent. This corresponds well with the view of Treitel (*Arch. fuer Ophthalmology*, xxxi, 1885), who, in analyzing the usual colorless scotomas, reached the conclusion that they are entoptic phenomena, representing the shadow of the opaque retina. Hilbert does not explain the causes of the color of the scotoma, only mentions that a green scotoma in a case of Rynkirk was probably produced by the color of the blood in a hemorrhagic focus of the fundus.

C. Z.

ON THE ANTIGENETIC ACTION OF THE VITREOUS.—POSSEK, R. (From the hygienic institute of Prof. Prausnitz in the Univ. of Graz. *Klin. Monatsblätter fuer Augenheilkunde*, xlv, Maerz-April, 1907, p. 329), reports his investigations with regard to biologic properties of the vitreous as precipitinogeneous substance, which

must be read in the original. Possek found hemolytic amboceptors in immunizing serum of the vitreous and infers a near biologic relation of the blood and the vitreous, perhaps owing partly to their common mesodermal origin. Possek summarizes: "The vitreous possesses receptors of second order; an immunizing serum, which, generated by injections of vitreous, precipitates in homologous and heterologous solutions of vitreous as well as in homologous blood serum, and contains hemolytic amboceptors. Hence may be concluded that the albuminous substances of the vitreous body may have common groups with those of the serum of the same species, with the same erythrocytes and with albumin of the vitreous of different species." C. Z.

SURGICAL CURE OF A CIRCUMSCRIBED ABSCESS OF THE VITREOUS.—CRAMER, E., Cottbus (*Centrbl. fuer Augenheilkunde*, Juni, 1907, p. 167). The right eye of a man, aged 26, was injured by a gun cap and a horizontal dark red scar was visible 2 to 3 mm. from the nasal sclero-corneal junction. V. and pupillary reaction normal. After a week a granulation had developed at that point and, with the ophthalmoscope, a globular yellow prominence at the nasal wall and opacities of the vitreous were seen. V. was reduced to fingers at 6 m. In chloroform narcosis the conjunctiva was carefully dissected and the closed wound, 2 mm. long, exposed. After an incision of 4 mm. into the sclera thin pus oozed, but repeated attempts to grasp a foreign body with an iris forceps were unsuccessful. The sclera was united by sutures. Uneventful recovery, so that the patient could be dismissed after 16 days.

Two weeks later the fundus looked a little veiled by opacities of the vitreous, but the foreign body could be seen in perfectly clear surroundings, changing its position very little on movements of the eye. After two further months the fundus was clearly visible, V. normal, foreign body in the same position but more movable. The whole course showed that this was undoubtedly a case of chemical aseptic suppuration and was a good illustration of Leber's views on the action of copper in the eye and its treatment. C. Z.

CONTRIBUTION TO THE KNOWLEDGE OF THE INFLAMMATION OF THE VITREOUS BODY.—VOGELESANG, W. L., Jr. (doctorate thesis), describes the difference of opinion regarding the disease "hyalitis" and the last successful trial of Straub. He gives a microscopical description of six cases (seven eyes) of hyalitis. First three cases of traumatic hyalitis. 1. A woman with cataract in both eyes and ozena. After irrigation of lacrimal sac and nose and after the symptoms had diminished from the side of the nose, Prof. Straub

performed extraction with iridectomy. A typical hyalitis developed, which remained progressive, although the wound is opened twice and atropin instilled, so that the eye had to be enucleated. The chief clinical symptoms were: strong secretion from the conjunctiva, chemosis, pus in the anterior chamber, opaque cornea, higher tension, strongly infiltrated wound margins.

2. A girl, 10 years old, had wounded the right eye four days before coming to the clinic. The symptoms of infection were found: an opaque infiltrated cornea, a thick iris not reacting to atropin, and opaque corpus vitreum, fever. The lens was touched and a traumatic cataract developed. In the beginning the eye progressed favorably, so that Prof. Straub made a broad incision at the corneoscleral margin and after iridectomy removed the swollen lens mass, when at the same time a fibrin membrane was removed from the anterior surface of the lens. The healing, however, did not continue. When the chemosis increased, the grayish reflex from the interior became more intense and the iris remained hyperemic; the eye was enucleated two weeks after the injury.

3. A 10-year-old girl injured her right eye with a steel fork. Examination showed swelling of the eyelids, vulnus corneæ and of the bulbar conjunctiva, slight infiltration of the wound canal and surroundings, iris hyperemic and blood in the anterior chamber and in the pupillary plane. Tension about normal. Patient was treated with salicylas sodæ and atropin. The pupil became from narrow, medium wide, and showed a posterior synechia and fibrin in the pupillary plane. The inflammatory symptoms increased (a small hypopion and pain on pressure developed). Then the hyperemia of the iris diminished, the pupil dilated and the exudate in the anterior chamber resorbed. But in the inferior nasal part an iridodialysis and rupture of the iris was seen and a grayish-white reflex from the fundus became visible. This hyalitis remained progressive. Fourteen days after the injury vessels in the iris could no more be seen, still some posterior synechiæ remained. As the fundus reflex increased and the tension became lower (-1 to -2), the eye was enucleated seventeen days after the injury.

Three cases of metastatic hyalitis (four eyes):

1. A man, 63 years old, was taken to the hospital for endocarditis. Five days later he complained of pain in the right eye; chemosis and discolored iris with a whitish reflex from out the fundus were found. Three days later patient could not see out of that eye, chemosis had increased and now a slight pericorneal injection with slightly opaque cornea and a small synechia are present. The chemosis and white fundus reflex increased till his death, seven

days after he began to complain about his eye. The postmortem showed parenchymatous degeneration of the heart with endocarditis, hemorrhagic infarcts in the lungs, infection spleen, encephalomalacia of the left frontal lobe.

2. (Two eyes.) A man, 62 years old, was operated on for hernia scrotalis sinistra with local anesthesia; twelve days later a hematoma, which had produced a rise of temperature, perforated. The temperature now remained normal for three weeks. A thrombosis of the vena cruralis developed through the hematoma becoming purulent. Six weeks after the operation temperature rose again, a week later an abscess developed on the left tibia and was opened next day. The fever remained remittent and 51 days after the operation patient complained of being blind. The probable diagnosis of metastatic hyalitis was made with the chief symptoms: membrane in the pupillary plane, superficial and deep injection and chemosis, pretty narrow pupils. The diagnosis became certain the next day, when a grayish reflex appeared from out both fundi and a small hypopion had developed in the right eye. The general condition became worse and patient died four days later.

3. A woman, 61 years old, came to the hospital with pyemic symptoms. On postmortem different abscesses and a pyelothrombose were found all dependent upon a purulent cholecystitis. Fourteen days after the patient was admitted, that is, eight weeks after the onset of the disease, the right eye became red. Two days later pericorneal injection, opaque, irregular cornea, exudate in the pupillary plane, little pus in the anterior chamber, chemosis were found. Four days later a distinct fibrinous membrane obscured the sight from the fundus. Three days later patient died.

Examination of these cases shows an edematous, streaky cornea with marginal infiltration, a serum rich in albumin in the anterior chamber, masses of leucocytes along Descemet's membrane, a fibrinous membrane in the pupillary plane, a more or less swollen, little infiltrated iris with posterior marginal synechia, little infiltration in the ciliary body, somewhat more in the processus ciliares; sometimes the ciliary body is edematous, which happens more frequently with the chorioid, which is infiltrated chiefly in the layer of the capillaries. In the serious cases the lamina vitrea (with here and there perforation) is lifted through the densely massed leucocytes from the layer of the capillaries. The retina is infiltrated in the lighter cases alone around the vessels; in the more serious ones the membrana limitans is lifted by the infiltration, which forms under this membrane. Dialysis retinae exist in all cases, but the extent depends upon the severity of the process. The sclera is as good as

normal. The part of the optic nerve before the lamina cribrosa is swollen through serous infiltration and leucocytes. The corpus vitreum contains the large mass of leucocytes and bacteria. We find the exudate massed chiefly in the neighborhood of the processus ciliaris and of the orbicularis ciliaris and before the optic nerve. The vitreous body is loose from the retina at some places (dialysis corporis vitrei), which produces a cavity filled with serum between the exterior membranes of the vitreous body and the retina. In the vitreous body itself, through separation of its membranes, cavities are formed, also filled with serum. Fibrin and leucocytes are also often found in these cavities. The wall of the cavities is a place of predilection for the bacteria, which produce rich cultures just there. Each case has its individuality.

These typical symptoms may be explained by pathogenic microbes having come in the corneal wound or in the retina and there propagating. From here they penetrated into the eye and found only favorable conditions in the vitreous body. The small resisting power against infection of the vitreous body is the reason that cases of such different etiology resemble each other so much in their further course. The inflammation of the vitreous body dominates the picture. The here-growing bacteria make poisons, which diffuse the bordering tissues, make the vessels more permeable for serum and attract the leucocytes. The serum thus attracted to the vitreous body cavity makes dialysis corporis vitrei and causes formation of cavities. It raises the tension. Probably also it causes dialysis retinae. The leucocytes are incited in all vessels of the eye by the same cause. They are attracted in the direction of the greatest concentration of the chemotactic substances present in the vitreous body. But the limitans interna retinae as well as the lamina vitrea chorioideae are little or not permeable for the leucocytes. These cells are thus so stemmed that they lift these elastic membranes from the underlying layers at different places. This obstacle does not exist in the ciliary body. It produces chiefly the exudate for the vitreous body. This is shown by the accumulation in the neighborhood of that part of the eye. The accumulation of the exudate before the optic nerve has another cause. The lymph of the vitreous body leaves the eye by the vessel sheaths of the optic nerve. It could be that the optic nerve functioning as a sieve collected the leucocytes in the posterior part of the vitreous body cavity. But the large infiltration here formed is owing to the general concentration of the toxins.

The article is nicely illustrated with microphotographs.

E. E. B.

LIGATION OF THE COMMON CAROTID ARTERY FOR MALIGNANT RECURRENT HEMORRHAGE OF THE VITREOUS.—DERBY, G. S., Boston (*Jour. Am. Med. Assn.*, July 13, 1907), reviews the literature and reports a case of his own in a woman of 51 without previous history of syphilis; normal heart, kidneys, vascular system, and no menstrual disturbance. There were dense organized opacities covered partly with hematogenous pigment and partly with fresh red blood in the vitreous of the left eye. Vision was reduced to counting fingers at one foot. In the right eye there was a small vitreous proliferation with V. = 6/xii, reduced later to 3/lx by recurrent hemorrhage which had also occurred in the left eye and reduced vision to perception of light. Large doses of mercury and iodid caused only slight improvement. Rapid temporary improvement from 1/ccc to 6/xxx +, in one week followed ligation of the carotid, but the hemorrhage recurred and sight was lost. Lactate of calcium and gelatin had also been used without effect. As to the operation there is now little danger from sepsis or of secondary hemorrhage, and the percentage of deaths need not be greater than that after ligation for pulsating exophthalmus. Cerebral symptoms, blindness from thrombosis of the central retinal artery, corneal lesions of a traumatic or dystrophic nature, somnolent hemianopsia and cataract are the possible but, of course, extremely rare dangers and complications. Two cases reported were successful; the author's was a failure. In all three, the operation was performed as a last resort against almost certain blindness, and seems justifiable in case of loss of one eye and negative results of treatment by other methods. In the discussion, attention was called to the fact that hemorrhages are due to disease of the small vessels, especially the veins, in the vitreous proliferations, and that they will inevitably recur, even after ligation, as soon as the collateral circulation becomes sufficiently strong. Ligation is dangerous. Death has followed in a case in which, on autopsy, it was found that the circle of Willis was absent. In another case, the operation, performed for cavernous sinus aneurism, was followed by retinal hemorrhages in a previously normal eye. The operation is an heroic remedy for a very serious condition and should be resorted to only in those extreme cases in which blindness in the remaining eye is threatened.

P. H. F.

Book Reviews.

The Ophthalmic Year Book.—EDWARD JACKSON, A.M., M.D.; GEORGE E. DE SCHWEINITZ, A.M., M.D.; assisted by THEODORE B. SCHNEIDEMAN, A.M., M.D. Volume IV. Containing a Digest of the Literature of Ophthalmology, with Index of Publications for the Year 1906. Illustrated. The Herrick Book and Stationery Company, Denver, Colorado, 1907.

I have again had the pleasure of noticing and commending this year-book. The amount of the year's literature relating to ophthalmology is immense. Quoting from the preface, "The number of pages in journals devoted especially to this branch that have come regularly to the attention of the editors in the three leading European languages are: For English, 4,750; German, 5,300; French, 3,500. In the bibliography references will be found to ten ophthalmic journals published in other languages. Of the 1,500 references to journal articles in the present volume, 26 per cent. are to articles that did not appear in journals devoted especially to ophthalmology, but in the hundreds of thousands of pages published last year in the general medical journals of the world. The number of pages in books and monographs listed in this volume aggregates over 30,000. Some of the shorter monographs are reprints of journal articles, but the larger ones appear as new books or pamphlets. The above constitutes only one year's additions to ophthalmic literature."

The authors also state: "To render the best of current literature available to all who practice ophthalmic medicine and surgery, as well as to furnish bibliographical aid to the thorough student, is the purpose of this publication. In this volume, for the first time, appear short biographical notices of deceased ophthalmologists, with reference to sources for fuller information regarding them. The wider acquaintance with ophthalmic literature brings a general interest in the personality of those who have contributed to it."

The authors have certainly covered the subject thoroughly and systematically and have abstracted the real contributions to the advancement of ophthalmology that have been published during the year 1906.

H. V. WÜRDEMANN.

Manual of the Diseases of the Eye.—MAY, CHARLES H., New York. Fifth Edition, Revised. 362 Original Illustrations, 22 Plates, 63 Colored Figures, 391 Pages. \$2.00. William Wood & Co. 1907.

The fifth edition of May's *Diseases of the Eye* remains the same neat and complete manual for students and general practitioners.

The fact that the text has been frequently reprinted, and now has its fifth revision in this country, and has a German, Italian, British, French, Dutch and Spanish edition, testify to its merited and universal popularity.

The subject matter is systematically and comprehensibly arranged. The cuts and colored illustrations are the equal of those in larger texts. The colored illustrations of the external diseases of the eye are especially instructive to the student whose first observations are naturally of the external conditions.

May's manual is heartily recommended to students and general practitioners.

SAMUEL G. HIGGINS.

Pathological Anatomy of the Eye.—GREEFF, RICHARD, DR., PROF., Director of the University Eye Clinic in the Charité, Berlin. 689 Pages, with 9 Lithographic Plates and 220 Figures in the Text. Berlin. 1902-1906. Verlag von August Hirschwald. 21 M. \$5.25.

Greeff's book is a volume of the text-book of special pathological anatomy of Prof. Joh. Orth, Berlin, but is a work complete in itself. Its 15 chapters are arranged according to the different anatomical parts of the eye, as conjunctiva, cornea, iris, ciliary body, etc., with the exception of those on sympathetic ophthalmia (omitted in the table of contents), myopia, glaucoma and hydrophthalmus. Each chapter is preceded by a very complete presentation of the normal histology of the respective parts, e. g., in the first one, of 111 pages, on the conjunctiva, the cylindrical epithelium of the palpebral conjunctiva is described and illustrated by drawings; then, in the same fashion, the pavement epithelium of the ocular conjunctiva, the cup cells, Leydig's cells, the mucosa with its adenoid and fibrous strata and its various glands.

Under inflammation of the conjunctiva general remarks on the characteristics of inflammation, the secretion, swelling, papillæ, follicles, are made. Since a considerable number of different forms of conjunctivitis are due to specific pathological agents, the author followed in their description the etiological principle in special paragraphs on conjunctivitis due to pneumococcus, diplobacillus of Morax-Axenfeld, Koch-Weeks, streptococcus, gonococcus, Klebs-Loeffler's bacillus.

On the now following 36 pages on trachomatous conjunctivitis, after a historical review, the histology of trachoma, viz.: structure of the trachoma follicles, changes of the epithelium, surrounding conjunctiva, tarsus, the differential diagnosis from physiological follicles, follicular conjunctivitis and bacteriological investigations are discussed. The next headings are conjunctivitis vernalis, petri-

ficans, nodosa, xerosis, pemphigus, amyloid and hyaloid degenerations, tumors, pinguecula, pterygium, tuberculosis. In the same thorough manner the pathologic anatomy and normal and pathologic histology of the other parts of the eye are treated, including, under optic nerve, a special section on changes of the vascular system due to age, arteriosclerosis, endarteritis proliferans and obliterans, thrombosis of the central retinal vein and artery, embolism of the central artery, influence of the carotid, ophthalmic arteries, etc., on the optic nerve.

The descriptions are very clear, aided by good drawings of original specimens, and the author will be sure of the highest appreciation of his great efforts in creating such a valuable work.

C. ZIMMERMANN.

Neurology of the Eye.—WILBRAND, H., and SAENGER, A., Hamburg. "Die Neurologie des Auges." A Handbook for Ophthalmologists and Neurologists. Volume 3, Part II. General Diagnostics and Symptomatology of the Visual Disturbances. 623 Pages, with Numerous Figures in the Text, and 6 Plates. J. F. Bergmann, Wiesbaden.

This part concludes Vol. III of the fundamental work of Wilbrand and Saenger, the first half of which we reviewed in the January 1905, number of *OPHTHALMOLOGY*, page 383. It contains the general diagnostics and symptomatology of visual disturbances.

In a general introduction, amblyopia and amaurosis are defined as any disturbance of the optic apparatus, either congenital or due to organic lesions from and including the optic disc to the cortical visual centers, and all merely functional nervous visual anomalies not dependent upon weakness of accommodation and alteration of the ocular muscular apparatus. Then the diagnostic values of testing vision, visual field, ophthalmoscopic examination, in themselves or combined with one another, of the visual disturbances in optic atrophy, neuritic affections of the disc, and, if complicated with meningitis, of color sense, adaptation, pupillary reaction, are set forth. After this the visual disturbances and tendon reflexes, especially patellar reflexes, are considered, preceded by a definition of reflexes in general and of tendons, followed by visual disturbances and skin reflexes, relations of amblyopia to anomalies of sensibility, motility and speech.

In chapter 18 the sudden amauroses are dealt with, unilateral and bilateral, after tumors, hemorrhages, embolism, thrombosis of the cerebral vessels, traumatism, lightning, infections, uremia, meningitis, loss of blood, intoxication, and in functional nervous ailments, scotoma scintillans, hysteric amaurosis, the so-called epi-

leptic amaurosis, the sudden amaurosis in chorea and after blepharospasm.

As in the former volumes the encyclopedic character of the handbook is maintained by the most exhaustive discussion of the different subjects, so that wherever consulted it gives the most thorough and satisfactory information. The utilization of literature is as complete as possible, 1,467 references being given and enumerated at the end. Of special value is the remarkable abundance of the authors' own observations. Their microscopic specimens are illustrated by splendid microphotographs of Dr. Reuter, whose directions of obtaining these are found right after the preface. Paper and print are of the well-known superiority peculiar to the publications of the renowned firm.

C. ZIMMERMANN.

Encyclopedia of Ophthalmology (*Encyklopaedie der Augenheilkunde*).—SCHWARZ, PROF. DR. O., Leipzig, Editor, with 54 Collaborators. Nos. 14 and 15. Leipzig. F. C. W. Vogel. 1907. 4 M. \$1.00.

With regard to the general scope and merits of this useful work, we beg to refer to our review of the preceding numbers in OPTHALMOLOGY, April, 1906, p. 586.

The present numbers contain very good articles (in alphabetical order) under the letters N, O, P, Q and R, e. g., optic neuritis, ocular affections in neuroses, nicotin poisoning and diseases of the kidneys and ear, nystagmus, ophthalmometry, ophthalmoplegia, optical illusions, optometer and an extensive and very thorough article on the anatomy of the orbit with illustrations by Lange, and its diseases by Elschnig and Vossius, optic disc, paraffin injections, parallaxis, parasites, Parinaud's conjunctivitis, perimeter, smallpox, presbyopia, prisms, psychoses, ptosis and operations for it, a very elaborate essay on the pupil, its physiology and pathology, Purkinje's images and phenomenon, mercury preparations, under which, however, the cyanate is omitted. Besides these, numerous subjects refer to separate articles in other parts of the book.

C. ZIMMERMANN.

Diseases of the Orbit.—BIRCH-HIRSCHFELD, A., PROF., Leipzig. *Graefes-Saemisch, Handbuch der gesamten Augenheilkunde*. Second. Entirely New, Edition. Nos. 112 to 114. 240 Pages, with 25 Figures in the Text and One Plate. Leipzig. Wilhelm Engelmann. 1907. Subscription, 6 M. \$1.50.

The author states that he retained Berlin's division of the subject matter in the first edition in 1, inflammatory affections; 2, hemorrhages; 3, injuries; 4, tumors of the orbit. As, however, the changes of position of the eyeball is the most essential symptom, common

to all diseases of the orbit, an entirely new chapter with this heading precedes the former and occupies these numbers of 240 pages. Here we find an exposition of the anatomic conditions important for the normal position of the globe in the orbit, as the relations of formation of skull and face to the configuration of the orbit, the consistency and dimensions of the tissues contained in the orbit, optic nerve, blood vessels and their outlets to the cavernous sinus and anterior facial veins, muscles, fasciæ and septum tarso-orbitale, with very good drawings.

Then the physiologic changes of the position of the eyeball dependent upon the size of the palpebral fissure, irritation and paralysis of the sympathetic nerve, of the position of the head, compression of the facial and jugular veins, circulation and respiration, are discussed according to the author's own investigations made with a new instrument he constructed, which allows of very exact measurements.

Under the now following pathologic changes of the eyeball in the orbit, Birch-Hirschfeld describes his modification of the exophthalmometer of Sattler and Hering, with illustration, which is accurate even to fractions of millimeters. A synopsis of the various forms of exophthalmus and enophthalmus shows that the analysis of the relations of pathologic changes of position of the eye to the anatomic and physiologic conditions is facilitated, if considered under two causes, viz., protrusion and protraction, retrusion and retraction, with their different subdivisions. Thus exophthalmus is considered under the following paragraphs: deformation of the osseous walls of the orbit in early childhood, as scaphocephalus, oxycephalus, hydrocephalus, rachitis, or from ectasia of the accessory sinus, frontal, ethmoidal, sphenoidal, maxillary, exophthalmus from increase of the orbital contents, from nervous influences, intoxications (by lead, paraphenylendiamin, which cause a general lymphatic congestion), acromegaly. Intermittent exophthalmus receives a detailed discussion with enumeration of 56 cases in tabular form, as well as traumatic enophthalmus with a table of 71 cases from literature.

The various theories of this rare affection are duly set forth, as atrophy of the orbital fat tissue due to direct traumatic destruction or pressure, or primary lesions of the nerves, the sympathetic or fifth nerve, expansion of the orbit by depression of the osseous walls,

cicatricial shrinking of the retrobulbar tissue after separation of continuity and hemorrhages, lesions of the orbital fasciæ and ligaments, with the conclusion that there is no uniform genesis of the affection. Most likely a series of different factors, isolated or combined, may produce traumatic enophthalmus.

Finally, dislocation and avulsion of the eyeball with casuistics, occurring during birth, self-inflicted in the insane, and by accidents, displacement of the eyeball into neighboring cavities, congenital enophthalmus and retraction of the eyeball, and very rare cases of pathologic changes of position of the eyeball are dealt with.

Many of the topics found a more detailed and complete discussion than ever before, rendering the elaborate work of Birch-Hirschfeld, with its numerous original observations, a most valuable addition to the great handbook.

C. ZIMMERMANN.

Handbook of Practical Surgery.—VON BERGMANN, E., Berlin, and VON BRUNS, P., Tübingen. Third, Revised, Edition, in Five Volumes. Volume I. Surgery of the Head. 987 Pages, with 167 Illustrations in the Text. Stuttgart. Ferdinand Enke. 1907.

This excellent handbook has met with such remarkable success that within a few years after its appearance a second and after three further years a third edition became necessary, entirely revised and presenting in all its parts the most modern views. It is intended to serve the busy practitioner, not only the specialist in surgery, for quick and exhaustive reference and orientation. This is facilitated by a table of contents and an exact alphabetical index at the end of each volume. The bibliography appended to each chapter points out chiefly such works which contain collective essays, synopses and complete enumerations of literature, so that the reader will be better guided in pursuing more exhaustive studies.

Volume I is of special interest to specialists of diseases of the eye, ear, nose and throat, as it contains the surgery of the head. The injuries and diseases of the cranium and its contents receive the most able representation by none less than the late E. von Bergmann, R. Kroenlein and C. Schlatter of Zürich, and P. Wiesmann, Herisau. Concussion of the brain, intracranial pressure and operations for it, injuries of the intracranial vessels and nerves, abscess of the brain, thrombosis of the veins, epilepsy after injuries of the head, the surgical treatment of epilepsy and cerebral tumors, technique of trephining, resection, craniotomy, craniectomy and osteoplasty, to mention only a few, are subjects which the oculist and

aurist will be eager to consult, as they often enough are confronted with such cases in the course of the treatment of their patients or in consultations for diagnostic purposes and the interpretation of the eye symptoms frequently accompanying these conditions.

Other important sections for them are the neuralgia of the fifth and occipital nerves by Prof. Fedor Krause of Berlin, the originator of the operation for extirpation of the ganglion Gasseri, malformations, injuries and diseases of the face, plastic operations.

W. Kümmel, Heidelberg, wrote on the injuries and diseases of the ear, nose, accessory cavities and, with E. von Bergmann, on the pharynx. Here the specialist will find quite a number of points brought out which, on account of their more surgical aspects, do not receive sufficient considerations in the special treatises on these subjects.

The diseases of the salivary glands by H. Küttner, of the jaws by C. Schlatter and O. Roemer, and the oral cavity by E. von Bergmann are the remaining essays of this volume.

Print and paper are excellent, and the illustrations have been improved and their number increased.

Volume II will contain the surgery of the neck, chest and vertebral column; Vol. III, abdomen; Vol. IV, pelvis, and Vol. V, extremities, and will be complete in a few months.

C. ZIMMERMANN.

Diseases of the Eye; a Manual for Students and Practitioners.—J. HERBERT PARSONS, D.Sc., M.B., B.S., F.R.C.S.; Assistant Ophthalmic Surgeon, University College Hospital; Assistant Surgeon, Royal London (Moorfields) Ophthalmic Hospital; Lecturer on Physiological Optics, University College, London, Etc. P. Blakiston's Son & Co., Philadelphia. 1907. 664 Pages. \$3.50.

This work is a credit to the author of "The Pathology of the Eye."

The arrangement of the subject matter and general scheme of the book is well expressed in the author's preface:

"The author of a new 'Manual of the Diseases of the Eye' may be expected, not unreasonably, to justify its appearance. I will, therefore, enumerate some of the chief objects which I have kept in view. (1) I have endeavored to facilitate the student's progress from his knowledge of the normal anatomy and physiology of the parts concerned to the consideration of their morbid anatomy and pathology. (2) I have elaborated the description of the funda-

mental optical and physiological principles, the true appreciation of which is the only sure basis of correct diagnosis and successful treatment. (3) I have confined myself for the most part to common diseases, only occasionally introducing rarer conditions to illustrate particular points of interest or importance. (4) I have described only well-established methods of treatment, eliminating all those which are of merely historical interest or questionable value. Some of the statements and views expressed may appear unduly dogmatic to the trained ophthalmologist, but I regard the didactic nature of the book as a sufficient apology for this feature.

"It will be noticed that errors of refraction are treated exhaustively from the optical point of view in the early portion of the work, as is essential for the skilful use of the ophthalmoscope. I hold strongly that the medical student should confine his attention principally to external diseases and the commoner ophthalmoscopic conditions. He should familiarize himself with the clinical appearances of the former group in the out-patient department, and I do not consider it necessary or advisable that these should be illustrated by colored plates. Ophthalmoscopic appearances are so novel to the beginner that much assistance is derived from colored plates, and representations of the principal diseases have, therefore, been included.

"Retinoscopy and the correction of errors of refraction by spectacles have been deferred to a late stage in the course, for only at this stage should they be seriously attacked. No student should be allowed to correct refraction without skilled supervision until he has attended a special course upon this subject and has devoted much time to it and obtained considerable experience in it. Such experience is best obtained at an ophthalmic hospital."

"One word, in conclusion, to the students for whom the book has been written. They may be dismayed at the optics which is the foundation of ophthalmology. I have treated the subject as simply as possible, and I earnestly impress upon them the necessity of mastering the essentials which are here presented to them. They will then, and only then, be equipped to deal with the pathological problems which follow."

The publishers have spared no expense in bringing forth an attractive and well-bound book, printed with excellent type and magnificent plates. The fundus pictures are well nigh perfect and are

a complete atlas in themselves. The author has added three interesting appendixes to complete the text. Appendix I outlines "The Preliminary Investigation of the Patient;" Appendix II comprises "Therapeutic Notes;" Appendix III gives "The Requirements of Candidates for Admission into the Public Services."

Parson's "Diseases of the Eye" is particularly recommended to those students who have a real desire to become familiar with the principles and practice of ophthalmology.

SAMUEL G. HIGGINS.

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

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Original Articles.

THE SIGNIFICANCE OF PUPILLARY INEQUALITY.

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PHILADELPHIA.

The expression "pupillary inequality" embraces the following conditions: paralysis of the sphincter pupillæ (pupil dilatation) of one eye without paralysis of the ciliary muscle; paralysis of the sympathetic (contracted pupil) of one eye; unequal dilatation and unequal contraction without paralysis. These chief varieties may be again subdivided according to the action of mydriatics and myotics and the response of the pupil to light and the coordination of the other intraocular and extraocular muscles, in changing the form and size of the pupils or in causing a greater reaction of one pupil than of the other. The inequality which is due to anatomic or pathologic peculiarities—for example, luxation or subluxation of the lens, loss of vision from detachment of the retina or atrophy of the optic nerve, persistent pupillary membrane, opacities in the media, the imperfect response to mydriatics because of adhesions of the iris to the lens or cornea—is a local condition only and is not a diagnostic feature in constitutional disease.

The value of inequalities of the pupil as a symptom in the diagnosis of diseases of the nervous system is problematic, unless they be part of a well-defined symptom-complex. They are common to many affections both of the nervous and circulatory systems and may also be present in functional disorders, such as neurasthenia and hysteria. It has been my habit, as I judge it has been with most clinicians, to endow pupillary inequalities with considerable weight and to look upon them as significant of grave affections and serious prognosis. My reading on the subject has, however, led me to think otherwise. When one remembers that they are not uncommon among individuals reputed to be perfectly healthy or who

fail to reveal any pathologic conditions, and then reviews the literature only to find that the diseases in which they appear are without number, one certainly has reason to doubt. Schaumann¹ quotes the writings of Haeddeus, Tzineagnentz and Fraenkel to prove that inequality of the pupils exists among healthy scholars of the lower schools and medical students, in frequency varying from 4 per cent. to 10 per cent. Ivanow claims to have found it in 91 per cent. of the 134 persons examined, and Felton² in 28 out of 61 individuals. The differences in the figures of trustworthy men can be explained only by different methods and times of examination and that the work may have been entrusted to assistants who were careless in their observations.

A few words concerning the normal pupil and its nerve supply may not be out of place. Lange,³ who reached his conclusion from the examination of 1,000 persons, says: 1. The size of the pupils differs greatly in different persons. 2. As a rule, women have larger pupils than men. 3. The size of the pupil decreases with age. 4. The width of the pupil is less in H. than in E. and greater in M. than in E. 5. After the fortieth year the difference in the width of the pupil in different states of refraction is inconsiderable.

Light Reflex.—The centripetal fibers arise in the retina, pass into the optic nerve, undergo semidecussation in the chiasm, continue to the geniculate bodies, the posterior corpora quadrigemina and then to the nucleus. The centrifugal fibers are those of the third nerve to the ciliary ganglion and the long ciliary nerves to the iris. The course pursued by the mydriatic impulse through the sympathetic system of nerves is generally accepted to be as follows: Originating from a center in the medulla it is emitted from the cord at the eighth cervical, the first, second and third dorsal nerves, to a connecting branch to the cervical sympathetic as far as the carotid plexus, thence to the nasociliary branch of the nasal nerve through the long ciliary nerves to the dilator muscle of the iris.

Mydriasis may be spasmodic or paralytic, the two varieties offering points of difference which in many cases will facilitate their discrimination and materially aid in the diagnosis of diseases of the nervous system from those of other parts of the body. Fraenkel⁴ thus defines spasmodic mydriasis: The reactions to light and convergence preserved, faradic stimulation of the skin does not always increase the dilation, mydriatics exaggerate it, myotics have a slight effect in reducing the size of the pupil. Associated with the

1. Zeit. f. Augenh. klin. Med., bd. xlix, p. 61.

2. Inaug. Dissert., 1895.

3. Inaug. Dissert., 1901.

4. La Presse Med., Sept. 18, 1897.

mydriasis are widening of the palpebral fissure and protrusion of the ball and sometimes increased lacrimation, anemia of the retina and paleness of the face on the side of the dilated pupil. It will be noticed that irritation, or spastic mydriasis, as it is often called, is only one of a chain of phenomena which may be properly assigned to irritation of the sympathetic system. Spastic myosis, on the other hand, probably has little to do with the sympathetic system unless it be in those rare cases of hysteria described by Westphal⁵ in which the myosis may occur independently of, before or during an attack. Until the pathology of hysteria is better understood it must remain in doubt whether the myosis is due to paralysis of the sympathetic or irritation of the pupillary branch of the third nerve. Bach⁶ offers an explanation of the inequality in some cases on anatomical grounds, namely, uni- or bilateral anomalous distribution of the centrifugal or centripetal paths or of the sympathetic fibers. "In neuralgia," he says, "the pupil is wider on the affected side, especially by transmitted light, while by intense binocular illumination the difference disappears." Sherer⁷ and Bloch⁸ have reported two cases of voluntary change in the size of the pupil, both individuals being capable of dilating at will independently of inspiration or expiration.

Paralytic mydriasis is with few exceptions a symptom of paralysis of the pupillary branch of the third nerve or of destruction of the ciliary ganglion. In the former the lesion may be ocular, intra-orbital, intracranial or extracranial—in the cord in the neighborhood of the eighth cervical or first dorsal. All reactions are abolished, excepting possibly the reflex from excitation of the skin on the same side. Atropia and eserine are without action. Cocaine by stimulating the sympathetic may cause a wider dilation. It is often associated with paralysis of other branches of the third.

A third form of unilateral mydriasis, indifferently termed functional or reflex, is found in many internal diseases in which the cerebrospinal system is primarily not involved. Excepting in a few instances the connection between the mydriasis and the disease is difficult to trace. Among the few may be mentioned organic changes in the structures of the neck, such as enlarged glands or aneurism of the carotid whereby the carotid plexus or the cervical ganglia or nerves are irritated. Schaumann¹ computes that about 23 per cent. of all internal diseases gives rise in some part of their course to mydriasis. He mentions certain lung affections, pleuritis.

5. Berl. klin. Wochenschr., bd. xxxiv, 1897.

6. Graefe Arch. f. Augenhe., lvii, No. 2.

7. Jour. A. M. A., May 6, 1905.

8. Deutsch. Med. Woch., xxxii, 1906.

diseases of the heart, chlorosis, pernicious anemia, appendicitis, diabetes, neurasthenia, hysteria. Moulton⁹ says that one-sided mydriasis, associated with a movable pupil, is always caused by irritation of the sympathetic and is an ominous symptom of beginning brain disease. It is more frequent among men than women and it is rarely seen in children. It disappears during sleep. To this class of functional or reflex mydriasis belongs the following case:

Miss S., a trained nurse, has, during the past year, been under a severe mental strain from a cause unconnected with her occupation. She continued to perform her duties only because of her fine character and strong will. Her physical health deteriorated, as shown by the loss of many pounds of flesh in a few weeks. She stated that the left pupil had been dilated at times for several years, the dilatation continuing for some weeks. It was induced or if present exaggerated by excitement or nervousness, was variable in degree and was less after sleep or a dose of bromo-seltzer. She had pain over and back of the eye passing to the occipital region and down the left side of the neck. V. = 1, esophoria $\frac{1}{2}^{\circ}$, vert. orthophoria, n. p., = 4 in., media and fundi normal. Heart rapid, indistinct systolic murmur, slightly enlarged thyroid gland; urinalysis negative. Although there was no proptosis or widening of the commissure, this might be a case of Graves' disease in its incipency, of which the dilated pupil was the earliest symptom.

Unilateral mydriasis, partial or complete, in association with a corresponding loss of accommodation, presents difficulties in diagnosis that are not readily overcome. As a rule, I believe, they signify the early stage of organic changes in the central nervous system, although they may with equal propriety be ascribed to disturbances of circulation, particularly in the absence of other signs of disease. When no ocular or orbital cause may be assigned the lesion is usually said to be in the nucleus of the ciliary nerve and iris or in the fibers connecting these nucleoli with the trunk of the nerve or farther back in the fibers radiating to the cortex. I confess organic or circulatory changes, limited to the anterior portion of the third nerve nucleus as a cause, is difficult of comprehension or, as Duane says, in speaking of paralysis of the extraocular muscles (Posey and Spiller), "Many of the cases that were thought to be nuclear paralysis are fascicular and not a few of the rest are basal. If, as is generally the case, in tabes and multiple sclerosis, the paralysis is evidently due to central causes, it is probably fascicular if more than one nerve is involved. This rule is, however,

⁹ Mass. Med. Jour., 1905, xxv.

not without exceptions, as several cases of multiple nuclear paralysis have been noted."

Eventually some of these cases commencing as isolated paralysis of the iris or ciliary muscle progress very slowly until other branches of the third and then all of them and finally other motor or sensory disturbances point to central tumor, tabes, progressive paralysis, multiple sclerosis and other cerebrospinal diseases. The following case is an example:

H. B., aged 12, consulted me in 1886. A few days before he noticed inability to read, although the right pupil had been alternately dilated and normal for nearly a year. It is now widely dilated and unresponsive. Left pupil responsive and not dilated, although both ciliary muscles are paralyzed. No muscular insufficiency; full acuity of vision. In two years the left pupil became dilated. The size of the pupil and the degree of accommodation varied, the latter never completely abolished until 1897 as long as he remained under observation. He died in 1901 of locomotor ataxia.

This case, interesting in that the opportunity was afforded of noting its progress through many years, is another demonstration of the common belief that ocular symptoms may long antedate the appearance of the classical signs of locomotor.

The second case of combined iridoplegia and cycloplegia is that of

Mrs. G., a married woman of 35. Early in July of this year the pupils became dilated, the right wider than the left, and have remained so, but not always in the same degree. She has also partially lost the power of reading. H. = 1 D., eso. $1\frac{1}{2}^{\circ}$, vert. ortho., no disease. She states that during menstruation the pupils are larger and she is less able to read than at other times in the month. There is no venereal history. The symptoms pointed rather to uterine than ocular disease. She was referred to Dr. Montgomery, who found cervical laceration and uterine displacement and advised operation.

The etiology in this case is obscure. It may be, as Duret believes, a narrowing or closure of one or more of the terminal arteries supplying the nuclei, a local endarteritis or minute clot causing degeneration of the nerve tissue, or, as Hutchinson says, a lesion in the ciliary or ophthalmic ganglion. Alexander, Mooren and Hosch (all three quoted by Wilder¹⁰) refer to a tertiary syphilitic lesion in the upper part of the third nerve nucleus. Wilder reports two cases of unilateral iridoplegia ascribed to disease of the ophthalmic ganglion which sends sympathetic as well as motor fibers to the eyeball. He says: "A small syphilitic deposit rightly placed in the orbit may produce iridoplegia."

10. *Ann. of Ophthal.*, April, 1897.

ON THE USE OF PARAFFIN SPHERES IN TENON'S
CAPSULE, WITH THE REPORT OF
FORTY CASES.

CHARLES NELSON SPRATT, S.B., M.D.

MINNEAPOLIS, MINN.

In the discussion¹ of a paper entitled, "A Protest Against the Employment of Paraffin," etc., read by Dr. A. E. Davis² in the Section on Ophthalmology of the American Medical Association, June, 1907, several members of the section very frankly recorded their failures in the use of paraffin spheres in the capsule of Tenon.

One speaker is reported as saying: "In a considerable experience in performing the Mules or Frost-Lang operation, he has found success common" (with the use of gold spheres), "but not so with paraffin, which has the disagreeable faculty of forming a point and working its way through the mucous membrane and coming out," etc. Another speaker is reported as saying that he used it in some half-dozen cases. His experience with the paraffin balls is that in about one-half they remained and in the other half were extruded.

As the writer, some two years ago, reported twenty-three cases,³ it seems proper that additional cases be reported and the possible causes of the unsatisfactory results mentioned by others be discussed.

Since the previous paper he has done the operation seventeen times, with one failure. This occurred in a man, 75 years of age. On the ninth day the paraffin presented and was removed. There was no infection.

Of the 40 cases the ages were from 5 to 75 years. With the exception of the one case above mentioned, healing took place as quickly in the old as in the young. All the cases, except six, were males. The eyes were enucleated following injury in 18 cases; disorganized globe, 10; staphyloma, 2; glaucoma, 4; kerato-iritis, 4; and ulcerating leucoma, 2.

The average duration of the chemosis in the first series was one week. In one-fourth of the cases the edema of the lids and the chemosis had disappeared within five days. In the last seventeen cases the chemosis and edema of the lids was more marked, and

1. Jour. A. M. A., July 20, 1907, p. 273.

2. Jour. A. M. A., July 20, 1907, p. 215.

3. Archives of Ophthalmology, vol. xxxiv, No. 2, 1905.

lasted from ten to fourteen days. This is explained by the fact that in these cases a larger ball of paraffin was used than in the first series, thus making the chemosis more apparent than real. One case developed considerable thickening of the subconjunctival tissue in the inferior cul-de-sac, due to the formation of new connective tissue. This was removed by a subsequent operation. A similar condition after the subcutaneous injection of paraffin has been described by Heidingsfeld.⁴ The edema of the lids and chemosis after Frost's operation, as might be expected, is more marked than after a simple enucleation or an evisceration, as the paraffin occupies a large portion of the orbit and gives one the impression of a marked swelling of the tissues. In the simple enucleation the swelling of the parts fills in the space formerly occupied by the eye.

The spheres are prepared as follows: Paraffin, with a melting point of about 60° C., is filtered through ordinary filter paper into large test tubes. These are sterilized by steam under pressure. When the tubes are cool, the glass is heated so that the paraffin can be removed as a solid rod. This is placed in a warm bichlorid solution and then cut into pieces and rolled into spheres about 2 cm. in diameter. To prevent contamination, rubber gloves should be worn while handling the paraffin. The spheres are preserved in a weak solution of bichlorid.

The operation is done as follows: The patient, being under general anesthetic, the skin about the eye and face is cleaned with soap and water, followed by alcohol, ether and bichlorid solution. The conjunctival sac is flushed with bichlorid (1:5000). A double layer of gauze, with an opening over the eye to be operated on, is placed over the face and ether cone. This prevents the sutures and the hands of the operator coming in contact with the ether inhaler, and aids materially in maintaining a clean field of operation. Aseptic precautions should be carefully observed, as an infection is sure to be followed by failure. The conjunctiva is divided close to the limbus and dissected backward beyond the insertion of the recti muscles. These are picked up on a strabismus hook and separated from the surrounding tissue. Before dividing the tendons from their insertion in the sclera, each is caught by a small clamp. The writer uses four Halsted hemostats, known as the "mosquito" pattern. These prevent retraction of the muscles and the possibility of losing them. After dividing the tendons close to their insertions, the globe is enucleated in the usual manner. A paraffin ball is then dipped in sterile water to remove the bichlorid and cut.

4. *Journal of Cutaneous Diseases*, Nov. 19, 1906, p. 513.

if necessary, to the proper size. The ball is seized with a pair of ordinary forceps and placed in Tenon's capsule. An elaborate introducer is entirely unnecessary.

The superior rectus is sutured to the inferior by a mattress or "U" suture and the two lateral recti in a similar manner. A slender, full-curve needle threaded with No. 00 chromicized catgut should be used. Large needles tear the tendon unnecessarily and the plain catgut is too rapidly absorbed. To prevent the muscle loops from slipping back over the ball and to give a common point of insertion, an additional suture is placed so as to include each muscle at the crossing of the two loops. Tenon's capsule is closed by a catgut purse-string suture. This relieves the tension on the muscle sutures, covers the ball with an extra layer of tissue, and prevents the latter from slipping out between the muscles. The conjunctiva is then closed with a purse-string, making, in all, three layers.

Care must be taken during the operation not to puncture the tendons unnecessarily, as each needle puncture causes the fibers to separate and a possible cutting through of the sutures. In the adult a ball 2 cm. in diameter will be found the most suitable size. After the enucleation the hemorrhage may be rather free, but the insertion of the paraffin checks this. No irrigation is used during the operation. A firm gauze dressing is placed over the eye. This is changed daily for the next four or five days and then discontinued. The pressure bandage has been found to lessen the subsequent chemosis. The reaction following the operation is about the same as after an evisceration. Chemosis, as a rule, lasts about a week, but may in exceptional cases continue longer. One patient was discharged from the hospital with no chemosis on the fifth day.

In Dr. Davis' paper, protest is made against two distinct operations, viz.: the subcutaneous injection of paraffin near the eyes and the use of solid paraffin after enucleation. It is the writer's desire to discuss only the latter operation. The case reported by Dr. Davis, giving rise to the objections against the use of the solid spheres after an enucleation, was as follows: The left eye of a 6-year-old boy was removed by a physician following an injury and a paraffin sphere was placed in Tenon's capsule. One year later irritation appeared in the second eye. Dr. Davis found the paraffin deeply imbedded in the orbit. After the removal of this, the irritation subsided. Ramsey⁵ reports a similar case after enucleation for a septic wound of the globe. One other case mentioned is by

5. *Lancet*, Jan. 31, 1903.

Parker in the discussion of Davis' paper in which irritation appeared after Mules' operation.

We know that foreign bodies are well borne by the different tissues of the body. Examples of this are the numerous kinds of non-absorbable material used for sutures. Glass, shot and silver wire frequently remain in tissue for years, causing no harm or inconvenience.

Experiments and clinical experience have demonstrated the fact that paraffin is well tolerated by the tissues. It seems not improbable that those cases reported, in which it has caused irritation, may be due either to certain impurities in the paraffin or a special susceptibility on the part of the individual. Certain persons are unable to take quinin; others develop a marked dermatitis from iodoform or atropin. Within the past month the writer has had a patient develop a marked dermatitis from the use of zinc oxid adhesive plaster. One would hardly feel warranted in protesting against the use of the zinc plaster because one case developed a dermatitis.

We have been advised to do a simple enucleation in all cases and not to attempt the employment of any prothesis of any kind. There is little doubt but that with the Frost or Mules operation a much better cosmetic result is obtained than after a simple enucleation. There have been a few cases of apparent irritation following the use of the prothesis. This has ceased after the removal of the latter. One would not advise against the use of artificial legs, because some stumps have become tender and painful, or against the wearing of artificial teeth because plates have been swallowed. All unfavorable cases, however, ought to be reported. Until the possible dangers of the use of paraffin and other substances in the capsule of Tenon have been demonstrated each operator must decide on his own method of operating.

It is generally conceded that there is much less probability of irritation after the Frost than after the Mules operation.

The advantages claimed for the paraffin spheres over those of glass, metal, etc., as stated in my previous paper, are: 1. The spheres are easily made and are inexpensive. 2. Are not likely to be broken as are those of glass. 3. Paraffin causes less irritation than any other material; therefore, is less likely to be extruded. 4. Paraffin is soon surrounded by a fibrous capsule, and is firmly held in place by connective tissue down-growths.

An inquiry into the causes of failure of the paraffin to remain in Tenon's capsule suggests the following:

1. The use of the prothesis in cases not suitable, as in panophthalmitis or infected wounds.

2. The use of too large a ball, thus causing too much tension on the sutures. In a phthisis bulbi or in a child, a small sphere must be substituted for the globe.

3. Improper closure of the wound, thus leaving space for the globe to come out.

4. In cutting the optic nerve, the tissue in the back part of the orbit may be injured, thus allowing paraffin to work its way backward, as is probable in the case reported by Dr. Davis.

5. The use of soft paraffin. This will become warm and have a tendency to change its shape and wander about in the orbit.

6. Lack of asepsis, either in preparing the sphere or during the operation. The face and field of operation must be well covered by gauze, as the contact of the sutures with the skin, hair, or ether cone may spoil the effect of the operation.

CAN A SUBSTITUTE FOR SIMPLE ENUCLEATION BE EMPLOYED IN EVERY INSTANCE?

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The object of this paper is not so much to critically discuss the various methods which can be employed as a substitute for a simple enucleation as it is to call attention to the very pertinent fact that whenever an enucleation is indicated or performed some substitute which will yield a more prominent stump is not only indicated, but absolutely justifiable. Unless the surgeon does make an effort or employ a method to produce a prominent stump so as to minimize the future deformities, he is not doing full justice to his patient. For every operation about the face has two distinct and separate end-views; primarily and essentially, curative; secondarily, a cosmetic value. To operate only for cure or relief, unmindful of the ensuing deformity, is likewise not doing one's full duty towards his patient.

In the face of perhaps severe criticism, I do maintain, upon broad principles, that a substitute of the Frost type should and can be safely employed, either directly at the time of enucleation or at a near subsequent time. When it is deemed advisable to do the implantation subsequently, it should be done before firm cicatrization of the orbital tissues has taken place. By a subsequent time I mean generally within two or three weeks after the primary enucleation. Doing it later than this, though the cosmetic result is enhanced, the range of motion is not materially benefited because of the previous atrophy and misplaced muscles. It is as Grimsdale and Brewerton (page 155) state: "But if we are by operation to avert the danger of loss of both eyes, we must surely do our best to endeavor to minimize the resulting deformity, and hence, despite its simplicity, *simple removal is slowly but steadily losing ground, as a routine operation in all cases, while one of the other substitutes is adopted.*" (Italics mine.) Only two methods are deemed worthy of serious consideration—the Mules and the Adam Frost type. All others yield comparatively insignificant prominence of the stump. Such methods as heteroplasty—either the implantation of animal eyes or tissues taken elsewhere from the body—do not yield sufficient uniform results

* Read at the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, held at Louisville, Ky., Sept. 26-28, 1907.

as to warrant their application or even encouragement. All simple suture stumps, though better than no attempt at all, need no consideration, for I believe that every one who does an enucleation ought to employ the purse-string suture and secure at least a moderate lessening of the cavity. These suture stumps are easy of performance and do not prolong healing, and certainly are more surgical, as all wounds ought to be closed as rapidly as possible to allay suppuration and enhance primary union of the coaptated conjunctiva.

Of the two methods up for discussion, the writer is an ardent follower of the Frost type and not of the original or modified Mules operation. Of the materials employed for implantation only two are worthy of consideration, namely, lead-free glass and decalcified bone (Suker and Faith method), and, of these, lead-free glass is the choice. For any other material than this is, in the course of time, affected by the body juices, and we know that our economy furnishes no acids or alkalies that affect lead-free glass. It is needless to enter into this question any further. We are all familiar with the literature and reports of cases dealing with this particular point.

It is a patent fact that capsule implantations can be employed in every case, whereas any other method of securing a prominent stump by implantation is only indicated in selected cases. One has a limited range of application, the other not. Therefore, why not employ it? No other substitute for simple enucleation than that of scleral or capsule implantation would yield as permanent and satisfactory a stump. The consistent employment of substitutes for enucleation by the writer for the past fifteen years has forced him to make this sweeping statement in favor of capsule implantation. No valid proofs have been presented which can substantially controvert this experience. Age itself is no contraindication for an implantation. In fact, it is even more obligatory in the young because it favors the uniform development of the socket. In young children about the age of 5 years or younger, if an eye is enucleated, that socket and side of the face is retarded in its growth unless a prominent stump over which a well-fitted shell can move is secured. Clinical experience has shown that a large movable stump as well as a full socket is essential for the uniform growth of a socket.

There is no real or valid surgical objection to simple enucleation. It possesses many advantages and all the disadvantages; the latter are the after-conditions, and these we ought not to forget, but make serious endeavors to obviate. These objections are:

First.—The orbital fat and muscles—even if a purse-string suture is used—atrophy and sink deeply into the orbit, leaving an extremely large cavity.

Second.—The upper lid invariably falls back into the orbit, leaving an unsightly hollow above. The lower only too frequently droops.

Third.—The stump movements are very imperfect.

Fourth.—The movement transmitted to the shell from this atrophied and shrunken stump is extremely and relatively small.

Fifth.—The vacant stare which is such a deformity is always present, so much so that many patients prefer an empty socket.

Sixth.—There is so much space between the concave shell and stump for the accumulation of secretions which frequently decompose and violently irritate the conjunctiva, causing the proverbial chronic conjunctivitis, and because of this discharge the shell easily becomes roughened, a point never to be disregarded.

Seventh.—Because of the above perpetual irritation, contracting adhesive bands are readily formed between Tenon's capsule and the subconjunctival tissue. Therefore, the cul-de-sac is gradually lessened in depth until finally it is so nearly obliterated that it is difficult to even insert a shell, to say nothing about wearing it constantly.

It is because of these seven very valid objections that I have for years urged the abandonment of the simple enucleation and have constantly and consistently practiced the implantation method. These implantations, however, to be only into the capsule of Tenon. For, though the Mules operation yields perhaps the most satisfactory cosmetic result, yet the globe is only too frequently extruded. Extruded, because the cornea, which is frequently retained, not being properly protected, gives way under friction, as all non-vascular tissues—particularly cicatricial—are liable to, as in reality the cornea becomes after an evisceration and a scleral implantation. The cosmetic value of Mules' as a whole is not any better or motion greater than in a properly performed implantation into the capsule cavity. My experience is not at all favorable to the Mules because of the extrusion, greater reaction and the possible danger that may attend the non-severance of the optic nerve. Unless a neurectomy accompany the Mules, the implanted ball often lies in close contact with the nerve, and may be the source of annoyance or reactions not unlike that of sympathetic irritation and inflammation. Then, too, it is rather difficult to get a perfectly fitting sphere into the scleral cavity, thus allowing a space between the sclera and the sphere.

Furthermore, the sclera does not exhibit a great tendency for the formation of granulation tissue and, therefore, no such cushion surrounds the sphere as it does when the same is implanted into the capsule. This cushion is absolutely necessary for the permanent retention of the implanted sphere. In order not to have the sphere extruded so frequently in the Mules, it is best to amputate the cornea, freely dissect the conjunctiva back—if necessary even tenotomize the four recti muscles—and after the sphere has been inserted into the sclera, the latter properly sutured, repress the whole into the conjunctival sac produced and bring a good layer of the latter over the sclera. The two sets of sutures are to be at right angles to one another. This mode of operating insures the longest retention of a sphere for the Mules method.

When an eye is in an active state of suppuration, an enucleation is perhaps attended with some dangers—principally that of perforation of the globe at the time of operation and the allowance of infection of the orbital tissues thereby. This may result, according to some case reports, in meningitis. It has been for this reason, and this reason alone, that methods have been tried which would fully answer as a substitute for enucleation, and these, in turn, have led up to the Frost and Mules methods of implanting a foreign body either into the capsule or scleral cavity.

If meningitis does follow an enucleation, it is not due to an extension of the infection along the nerve sheaths, but to an infection through the orbital roof. This is so because of free drainage and the direction of the lymph current, which is from the skull forward along the optic sheaths and emissary veins.

The element of time requisite for the healing of a capsule implantation should not argue against its employment. It usually takes about ten days before the patient can resume his work, and within three weeks from the time of operation he can safely wear a shell. Though operators hold the element of time up against any other method than the simple enucleation, it is not a sufficient cause or reason not to perform implantations whenever possible. The only time when implantations can not be done immediately at the time of enucleation is, perhaps, when one is dealing with a suppurating globe. Then it may be advisable to defer implantation for a short time. Under such conditions one can eviscerate, wait until suppuration has ceased, then amputate the scleral cup, and proceed in a manner like unto the simple capsule implantation. In case a Mules' is unsuccessful or the sphere is subsequently extruded, the scleral cup can be enucleated and the self-same sphere

implanted into the capsule cavity. It is never wise to again attempt a scleral implantation when once there has been an extrusion.

Not even intraocular tumors militate against capsule implantation. This certainly, however, with the proviso that the globe was enucleated before perforation has taken place, and that metastatic nodes have not appeared in the orbital tissue. The writer has two such cases, both sarcoma of the chorioid, in which he performed a capsule implantation some two years ago, and up to the present writing no evil consequences have supervened because of said implantations.

No major operation—and certainly an enucleation is a major one—is always attended with proverbial success. Failures are bound to occur. But what harm is there, even if after a lapse of time, the implanted sphere, for some cause or another, is extruded? You have not jeopardized the safety of the patient or the fellow eye in any way. For, as has been conclusively proved (de Schweinitz, Mules, Suker), these implantations into scleral or capsule cavity have not produced a clear-cut case of sympathetic ophthalmia, provided that they were performed in the proper manner and at such a time when simple enucleation itself would have prevented such disastrous complications in the fellow eye. These latter remarks hold true only for the Mules operation and need not be considered in case of simple capsule implantation. Certainly the implantations into capsule cavity are absolutely unable to produce sympathetic reactions, for obvious reasons, the eye having been removed. Should, however, sympathetic ophthalmia ensue, it would have ensued even if no implantation had been performed, as the seeds thereof had already gone beyond operative relief. This argument of sympathetic inflammation following capsule implantation is not founded upon good reasoning, and to a large measure the same holds true for the Mules'. An implantation into the scleral cup can only produce so-called sympathetic irritation and not inflammation, just as any stump may cause an irritation, and then the removal of the sclera followed by a capsule implantation will be a satisfactory and justifiable procedure. It will be found that in those cases where sympathetic irritation follows either scleral or capsule implantations the wearing of a shell itself is frequently a sufficient cause for the reaction. It is granted that sympathetic irritation does not follow capsule implantation as often as it does scleral implantation. This for the reason that none of the essential ocular tissues are retained in executing a capsule implantation. Before attributing the irritation to either method the patient should not be allowed to wear

a prosthesis for some time in order to see whether or not the stump itself be the real cause or the two conditions combined—the stump and shell being the factors. If the former, it is a very simple matter to remove the whole stump or the implantation proper.

It is deemed essential, in either simple enucleation or its various substitutes, that the patient forcibly and regularly exercise the lids in order to prevent any sinking in of the upper or drooping of the lower. The act of forcibly winking is an admirable procedure for them to perform. So also is massage of the lids. It is also essential that the prosthesis fits accurately in order to allow perfect closure of the lids. Furthermore, the sinking and drooping of the upper and lower lid is further guarded against by preserving the function of the sympathetic nerve fibers which supply the two. For this reason do not open the capsule posteriorly any more than just sufficient to permit the passage of an instrument for the severing of the nerve. This sunken-in appearance and the drooping of the lids can in a measure be ascribed to the enophthalmic condition; that is, the stump is comparable to a traumatic enophthalmos.

A word or two with reference to the operation. For the implantation the sphere is boiled for several hours in a 1-5000 bichlorid solution, then washed in a saline solution before inserted into the capsule cavity, after a very careful enucleation has been made, preserving every particle of tissue possible.

The muscles and some capsule tissue are now brought over the sphere by a catgut purse-string suture. After this, the conjunctival and subconjunctival tissue is drawn by a series of interrupted sutures over the muscles and sphere. As soon as possible an ice pack is applied to the part for several hours, to be repeated two or three times a day for two consecutive days. The ice application allays any marked reaction or edema. The conjunctival sutures are usually removed within a week or ten days, depending upon conditions.

ON OPTIC NEURITIS OF INTRAOCULAR ORIGIN, ESPECIALLY THE FORM DUE TO ACUTE PLASTIC CHORIOIDITIS.

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Optic neuritis limited to one side has always been considered etiologically different from disease of both nerves. Unlike the latter it is neither due to kidney disease nor to an intracranial lesion (except when this is localized near the optic foramen). It may be caused by syphilis. Perhaps most frequently it is the sequel of an infection like typhoid fever, influenza, diphtheria, etc. Often no cause can be ascertained and we can only infer that infectious material from some unrecognized focus in the system has reached the optic nerve for unknown reasons. Only recently attention has been called to the possible connection with suppuration of a nasal sinus.

I wish to call attention to a special mode of pathogenesis of some instances of optic neuritis, viz.: those in which the nerve is involved in connection with chorioidal disease. The subject is hardly mentioned in ophthalmic literature. Deutschmann had found in his studies of sympathetic disease that injection of pathogenic bacteria into the vitreous may cause an ascending neuritis. Ullrich¹ confirmed this and noticed especially that inflammation of the ciliary region or periphery of the uvea thus produced may lead to optic neuritis without visible extension from the first focus to the nerve. He also mentions that neuritis is sometimes observed in connection with iritis. A. Knapp² has recently emphasized the occasional occurrence of optic neuritis after injuries or inflammation of the anterior half of the eyeball. He quotes older observations by Hirschberg and Fehr and some pathological findings by Elschmig to the same effect. But the main interest centers, according to my observations, in those cases in which the chorioidal lesion is so insignificant that it can be easily overlooked.

The form of chorioidal disease to which I wish to call particular attention is central circumscribed chorioretinitis of self-limited course. In a previous paper³ I have tried to distinguish this type

1. Von Graefe's Arch. f. O., vol. lviii, p. 268.

2. Trans. Am. Ophth. Soc., 1906.

3. Annals of Ophth. and Otology, January, 1893.

of disease from other forms of chorioiditis by reason of its acute onset, self-limited course, permanent termination without relapses and limitation to one eye and to one single focus. Although referred to by various authors it had not been previously differentiated from other types of chorioidal disease and, indeed, has, since my paper, not been described as a clinical entity except by Hall Griffith in Norris and Oliver's *System of Diseases of the Eye* (under the name Chorioiditis with Desceminitis). My own conclusions in 1893 have, however, been confirmed by my further experience since that time. The disease begins with sudden dimness of the one eye which reaches its climax in one or at the most a few days. According to the size of the lesion the sight clears sooner or later until after some two and one-half to six or eight weeks a permanent condition is reached. According to the extent and location of the chorioidal lesion a relative scotoma remains which may either damage central sight considerably or may only be demonstrable with difficulty, as it may not annoy the patient.

The lesion is seen as a single patch of chorioidal inflammation varying from a small grayish-yellowish cloudiness to a dull white plaque according to its size. Its edge, at first not well defined, soon becomes distinct. Where retinal vessels cross the patch their level is not altered. As it heals it leaves an atrophic spot with slightly pigmented fringe. The vitreous shows some cloudiness over the patch at first. When the spot is large, increased reflection to the ophthalmoscopic light gives it a shimmer. The plaque varies in size from about one-quarter to a full papillary diameter. It is always centrally located, near the disc, sometimes involving the macular region. In a few instances it has bordered on the disc.

In all instances, with possibly one exception, punctate deposits were found on the Descemet membrane some days after the onset, sometimes in a goodly number, sometimes only two or three minute but distinct specks. When scant in number these deposits must be sought for by lateral illumination and a magnifying lens. In some instances there was a faint ciliary blush for a few days; at times, too, a slight pain. The pupil was either normal or enlarged to a minimal extent.

In no case was the etiology quite clear. The seat of the inflammatory lesion made it most probable that infectious material reached the chorioid through one of the posterior ciliary arteries. The tissues were evidently able to overcome this infection after a short reaction. The material may have come from a suppurating

maxillary sinus in one instance, an endometritis in a few others, while generally its source could not be ascertained.

The disease is not very common. In the course of years I have watched twelve instances during the active course, not counting cases that I saw incidentally years after they had recovered from this chorioiditis with persistence of an atrophic patch and a relative scotoma. Of the twelve cases, seven were complicated with optic neuritis. Whenever the patch of chorioiditis was fairly large and situated some distance from the edge of the papilla, the nerve was slightly swollen, cloudy, and its edge effaced, without any hemorrhages or in some instances a minimal spot of effused blood. The neuritis always subsided inside of three weeks, leaving no anatomic changes or functional damage. The diagnosis of neuritis as a complication of chorioiditis was self-evident in these cases.

The real diagnostic interest centers in those instances in which a small chorioiditic patch either adjoined the disc or was so insignificant that it could have been overlooked readily by an observer not fully familiar with this disease.

My attention was aroused principally by one instance, a man of about 30 years, in whom the swelling of the papilla extended upward and outward into the retina in the form of a whitish wing about one-third the diameter of the papilla, with slight vitreous opacity over it. In the course of a week the retinal cloudiness diminished and pigmentary proliferation beneath became visible, while deposits on the rear of the cornea now make their appearance. Ultimately the characteristic atrophic patch with pigment fringe confirmed the diagnosis of a primary chorio-retinitis with optic neuritis as a complication.

The two following observations were even more difficult to interpret in the beginning:

CASE 1.—Mr. S., 27 years old, in good health and without specific history. Since four days moderate dimness of L. E. with a dark spot in front of patient's sight. Trifling ache in and around L. E. R. E. normal and V = 20/xx.

L. E. V. = 20/xv, but objects seen dim, especially downward. Distinct optic neuritis with haze extending just beyond the disc into the retina. Vitreous not perfectly clear. The macular region appears cloudy and the vessels in that area are faintly beaded. No other lesion found in the body. Urine normal.

In the course of two and one-half weeks the neuritis disappeared. In the macular region the turbidity had become more circumscribed and now changed into a grayish yellow discoloration with slight pigmentation around the border. Sight improved to 20/xx, but a

distinct relative small scotoma could now be demonstrated just below the point of fixation. Four weeks later the chorioretinal lesion appeared more like an atrophic spot with slightly increased peripheral pigmentation. The scotoma was unchanged. My notes do not refer to examination with lateral illumination, and a faint Descemetian deposit if present must have escaped me.

CASE 2.—Clara I., a healthy child of 11 years, complains since two weeks of mist before the L. E. without any other symptom. R. E. normal in every way. L. E. V. 20/lx, well pronounced optic neuritis with cloudiness barely extending beyond the edge of the papilla into the retina, except upward and inward, was a wing-shaped area of cloudiness spread out beyond the disc. Very fine opacities of the vitreous in front of the papilla and of the inflammatory patch.

The diagnosis of a primary neuro-retinitis had to be changed when about a week later a few minute though distinct deposits appeared upon the posterior surface of the cornea. The sight had begun to clear by this time. As the neuritis and cloudiness of the adjoining retinal region subsided it became evident that the primary lesion was in the chorioid underneath the cloudy retinal area. The retina regained its transparency fully, but the chorioid patch assumed an atrophic appearance with a faintly pigmented fringe. This appearance, together with the slight vitreous opacity and the Descemetian deposits, indicated clearly the disease as a chorioidal inflammation with secondary neuritis and involvement of the retina. After seven weeks (or nine weeks from the first symptom) no lesions remained except the chorioid patch of altered pigmentation. The sight was normal, while the presumable scotoma adjoining the blind spot could not be demonstrated positively in the child.

The complete recovery from the neuritis in all my patients in about two and one-half weeks suggests that the disease of the nerve was probably due to toxins produced in the chorioid focus. The course of the neuritis as well as of the underlying chorioiditis was not distinctly influenced by the treatment of different patients with salicylate and iodid. My records show, however, that moderate doses of calomel given in the beginning of the disease were always followed immediately by a more rapid clearing of sight.

Besides the plastic chorioiditis so far described, other forms of chorioiditis can also lead exceptionally to a secondary optic neuritis. I have observed at least three instances in which one-sided optic neuritis accompanied an exacerbation of a pre-existing chorioiditis of unknown origin. In one of these the chorioidal foci were far away from the papilla, being well toward the periphery of the fundus.

THE BEST METHODS AND MEANS OF EXAMINING EYE PATIENTS.*

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My purpose in selecting this subject is that I may present some thoughts for the helpfulness of others, and that out of the discussion to follow I may get helpfulness. In discussing methods I shall also speak of means. As there are good methods and bad methods, so are there good means and bad means. The best methods and best means should be resorted to always, in any and every pursuit of life, if the best results are to follow. This is particularly true of ophthalmology, that branch of medicine which approaches most nearly pure science and perfect art. I shall not attempt to speak of the best method of examination for every disease and defect of the eye, and can speak, therefore, only of correspondingly few means.

A patient coming with the symptoms of a foreign body in the eye should not be sent away except at the end of a double searching of the two parts, the cornea and the inner surface of the upper lid, where foreign bodies are nearly always found. The first search should be made with the unaided eye, both without and with focal illumination. Failing to find it in either of the two places, then the search should be renewed with a magnifier, both without and with focal illumination. The best magnifier is the Jackson binocular, for which the single 16 D. lens is a poor substitute.

A patient who has been injured comes complaining that he is totally blind in one eye. There may be no superficial condition to account for it, and even under the ophthalmoscope the fundus may appear normal. Of course the diplopia tests should be resorted to, as should the test by red and green letters looked at with a red glass before one eye and a green glass before the other, following the viewing of the letters without the intervention of the colored glasses. If he is blind in the eye before which is the green glass, only the red letters will be seen, and vice versa, if the eye is blind before which the red glass is placed, only the green letters will be seen. If all the letters are seen in this test the proof is positive

* Read before the Section on Ophthalmology of the Southern Medical Association, at Birmingham, Ala., Oct. 24, 1907.

that he is not blind in either eye. By all odds this test, both as to method and means, is most reliable. Another test in such cases is a study of the pupillary reaction, which may be either trustworthy or worthless, depending on just how it is done. When properly done it stands, in value, next to the red-and-green letter test, in cases in which there is no apparent pathology. The method can be shown best by a report of a case:

A young man was caught between two cars in such a way as to cause but slight external injury and none at all of the globe, yet when he recovered consciousness he claimed that he could see nothing with one eye. An opinion that he was feigning blindness was based on the fact that his pupillary reaction was normal. Even if the method had been right, the fact that pupillary reaction was good could not have been positive proof against blindness, for when causes of blindness are higher than the base of the brain the pupil reacts to the light. In this case the method was faulty, for both eyes were equally exposed in the test, and the pupil of the blind eye acted with the pupil of the good eye. The railroad officials desiring a second opinion for their guidance in dealing with the man, he was sent to me, with the suggestion that he could not be blind, for the reason that one pupil was just as active as the other. My attention having been thus directed, my first and conclusive test was of the pupil. I darkened perfectly the good eye with a folded handkerchief and palm of the hand. The pupil of the other eye began to dilate slowly, and in a little while was semi-dilated and wholly unresponsive to light and shadow. On uncovering the good eye, both pupils contracted and dilated in perfect harmony. Thus I was enabled to say that the man's claim was correct. The site of the injury was between the optic chiasm and the globe, and at a point not to interfere with the retinal artery, for the fundus was normal in every respect. On my opinion the company sought and obtained a better settlement than they could have gotten in court. If I had found pupillary reaction when the other eye was covered, then the red-and-green letter test would have been necessary. However, in total monocular blindness the cause is either in the nerve or the eye, hence both of these tests would be equally applicable. It is in partial monocular blindness that the pupil test is of less value than the red-and-green letter test.

Blindness caused by disease or injury of tract or brain affects the two eyes equally and in corresponding halves. When vision is less than normal in one or both eyes the cause should be sought, and in most cases can be found if the best means and methods are

resorted to. If disease has caused the deficiency it may be found in the refractive media or in the fundus. If it is in the cornea or lens, focal illumination should reveal the cloudiness, but the ophthalmoscope, with strong convex lenses revolved behind the sight hole, is the best means of finding minute changes in the lens substance. The ophthalmoscope alone must be used for finding opacities in the vitreous. As to the fundus, our only means is the ophthalmoscope, and of the two methods, the direct and the indirect, the former is the better because of greater magnification. The instrument which is best both for the beginner and for the expert, therefore for all, is the one without the troublesome reflexion, with which every one is so familiar, but from which every one may now be free. I had the good fortune a few years ago to find the cause of this annoyance, and suggested that it might be removed by making the openings in the mirror and metal conical instead of cylindrical. The instrument thus made is perfect. The corneal reflex can not be removed nor does it interfere.

No method of examination of a case of purulent ophthalmia, whether in the newborn child or in the adult, is complete which omits a microscopic examination of the discharge in an early stage of the disease. Any one of these cases may prove disastrous to vision, even under the most skillful management. Suits for malpractice may be averted if the gonococcus has been found, for people do not want this little witness to appear against them in court. The best safeguard is to take the bacteriologist with you to see the case, and let him get for himself the discharge to be examined, so that he might be able if necessary to swear that the discharge containing the gonococcus came from the eye that has been lost or damaged. Such threatened suits can thus be settled out of court without the cash.

Since the main purpose I have in view is not to discuss, to any great extent, the methods of diagnosing disease, and the means that would be most helpful to this end, I will now turn to the chief purpose, the best methods and means for examining our patients for errors of refraction and muscle imbalance. To these patients, first of all, we should give an attentive ear, for they like to tell of their woes, although their stories may be long drawn out in the rehearsal of tales to the effect that they have suffered many things at the hands of many physicians. These complaints, unfortunately, are sometimes just, and for the reason that the investigations have fallen short of fulness. An attentive listener inspires confidence, and the imposed confidence compels one to do his best for the case

in hand, but this he can not do, unless he can arrive at a correct conclusion as to the chief error and all its complications. It is wrong to jump at any conclusion, and it is an injustice both to the patient and the practitioner to conclude, without evidence, that the case in hand is one of focal error only, and that the relief must come from lenses. Errors of refraction are common, and they contribute their part to the sum of human misery. Maladjustments of the ocular muscles are likewise common and cause as many ills as do focal errors. To ignore the latter in efforts to correct the former leads to many sad failures. Why ignore either? A few minutes of methodic investigation will enable one to find any one or all of the dozen or more errors that cause eyestrain, and to assign to each error its proper value.

To outline to you what I believe to be the best plan of procedure, I need only tell you my methods of search, and the value I place on any single finding. First of all, I ask the patient to call the smallest letters on the test card, twenty feet distant, distinctly seen. If less than 20/xx, I know there is some focal error (barring, of course, the existence of any disease), but if vision is 20/xx I do not know that his eyes are perfect, but soon may know. To clear the doubt as to the possible existence of a focal error, I hold a pair of + 2.00 D. lenses before his eyes, and ask him to call the smallest letters he can. If, under this test, vision is 20/c only, or even 20/lxx, there is but little, if any, hyperopia, but if vision is 20/l or better hyperopia exists. I next hold a pair of + .50 D. cylinders, with axes vertical, before each eye, and ask him to read the smallest letters seen distinctly, and then, placing the axes horizontal, I ask if he sees the same, or better, or reverse. If better or worse, this favors the existence of astigmatism, but if the two positions give the same vision I can not declare against astigmatism until I place the axes obliquely, first at 45°, axes converging above, and then at 45°, axes diverging above. If in these two positions vision is also equally sharp, there is no astigmatism, but if better in the one oblique position than in the other there is astigmatism. All of this is done without a mydriatic, and still more must be done before the preliminary examination can be counted complete.

I now place the monocular phorometer before the patient with the view of detecting any one or several of the heterophoric conditions, or eliminating all of them from the case in hand. The instrument is set first for detecting and measuring any error of the lateral recti muscles of either one eye or the other (the advantage of this instrument is the fact that only one eye is under test at any

one time, the other eye being wholly free from any interference). I place the 6° displacing prism, base up, behind the revolving prisms whose axis is at zero, with the arc in position for measuring lateral displacements. The patient is told to fix his vision on the upper dot or light (better, a white dot in the center of a large blackboard) and to tell whether the lower is directly under the upper, and, if not, is it to the right or left of an imaginary line passing directly down from the upper dot. If the false object is seen by the right eye and is to the left of the true, exophoria for the far is shown, and this exophoria is always intrinsic in that there is a too powerful externus or a too feeble internus. The real nature of the case should later be determined by the duction test.

Should the false object, when seen by the right eye, be to the right, there is esophoria for the far, which may be either intrinsic or pseudo, and, if intrinsic, may be due to the fact of a too powerful internus, or a too feeble externus which should be shown later by the duction test. If pseudo, the eyes under test are hyperopic, which may have been shown by the preliminary test with the $+ 2.00$ D. lenses. If there is emmetropia or myopia, any esophoria for distance is intrinsic, a condition which can never be cured by lenses, while pseudo-esophoria is always curable by the correction of the hyperopia on which it depends. The test of the lateral muscles, at the near point, should be the next step of the examination. This I do with the phorometer in adjustment as for the far test, holding, at the reading distance, a white card in the center of which is a black dot. If the false dot, seen by the right eye, is to the left, there is exophoria in the near, the amount of which can be measured by the revolving prism. This exophoria may be intrinsic and in full only when the refraction is emmetropic. If the refraction is myopic, a part or all of the exophoria in the near is pseudo; and, if the refraction is hyperopic, any exophoria shown is intrinsic, but a part of the full error has been neutralized by a pseudo-esophoria. It is in these cases that correcting lenses increase the exophoria.

In emmetropia there may be either a pseudo-exophoria or a pseudo-esophoria in the near, orthophoria for distance having been shown, these errors depending entirely on the ciliary muscles. This pseudo-exophoria points to ciliary muscles which are so large and strong as to require only a small impulse from the brain for focusing a near object, while the pseudo-esophoria points to ciliary muscles that are small and weak and call for a strong impulse from the brain for seeing well the near-by object. To account for this we

need only accept the teaching of Donders as to the intimate relationship between the centers of accommodation and convergence.

Before leaving the lateral muscles I may say that, in emmetropia, if the ciliary muscles are normal in size, and if the tonicity of the externi exactly equals the tonicity of the interni, the test at both the far and near points will show orthophoria; that is, the false object will be directly under the true.

The next step in the investigation is to place the revolving prisms so that their axes when at zero will be in the horizontal position which must be shown by the spirit level. Now a 10° prism must be placed, base in, behind the revolving prisms for the purpose of doubling the test object, or dot. The judgment as to both verticality and horizontality is a gift and not an acquisition; hence, when any patient is asked if the two dots are level, the correct answer will come quickly. If they are level, there is vertical orthophoria. If the right dot is higher than the left, there is right cataphoria or left hyperphoria; if it is lower than the left, there is right hyperphoria or left cataphoria, and in either case the error is intrinsic, for there is no such thing as a pseudo-hyperphoria or a pseudo-cataphoria. The center of accommodation and the centers controlling the superior and inferior recti have no interrelationship or dependency the one on the other. Each of the vertical errors should be accurately measured by the revolving prisms. Since these errors are always intrinsic, the correction of errors of refraction does not influence them in the slightest if the visual axes pass through the optic centers of the lenses, or through any other point of the lenses which are equal in refractive power. The error may be made less, or even greater, if one lens is stronger than the other and both visual lines pass through similar points of the lenses either above or below the optic centers.

The next step is to investigate the oblique muscles. To do this the displacing prism is not needed, but only the rotary prisms. The arc is set as for detecting and measuring vertical errors or for taking sub- and superduction. The test may be made both at the far and near points; if in the far, the object should be a white line on the reverse side of the blackboard, but, if in the near, a black line on a white card, to be held in the hand, should be used. Rotating the index of the double prism up beyond 3° develops diplopia, the false line appearing above the true. If these lines are perfectly parallel, there is orthophoria of the obliques.

Rotating the index into the lower arc 3° causes diplopia, with the false line now below. If the two are parallel, there is ortho-

phoria of the obliques. But if, in either of these tests, the false line approaches the true more nearly at one end than at the other, there is cyclophoria. If the false line dip toward the opposite side, there is plus cyclophoria, but if it dip toward the corresponding side there is minus cyclophoria. While this method will detect cyclophoria, and even determine the kind, it can not measure the quantity. The error having thus been found, its quantity must be measured by the cyclophorometer. It is only with the cyclophorometer that the room must be darkened, and the test object must be a candle or a small gas jet. The triple rods should be placed in their cells at 90° , and behind one rod a 5° prism should be placed, base up, for the purpose of doubling the streaks. If, in order to parallel the streaks, one rod must be revolved 5° templeward, there is 5° of plus cyclophoria, but if nasalward there is 5° of minus cyclophoria.

The above test should be made not only for detecting and measuring heterophoria, but it should be resorted to in all cases of heterotropia. In these cases diplopia is hard to develop, but the placing of a red glass before the squinting eye makes it fairly easy of accomplishment.

The duction tests to be studied next do not apply to cases of heterotropia or squint. In no case of heterophoria can one know the real nature of the error without resorting to the duction test, the dot or light always at 20 feet distance or more. My means for testing the contractile power of a lateral rectus muscle under the stimulus of a basal center is the rotary prism, and my method is to test first the strength of the externus of one eye, rotating the index into the arc for abduction to the point of doubling. Should this point be 8° or less the externus is not too strong. To take the adducting power a supernumerary 15° -prism, base out, must be placed behind the rotary prism, the axis of the latter standing at 10° in the temporal arc so as to neutralize two-thirds of the power of the added prism. The rotary prisms must now be carried to zero and thence into the adduction arc to the point of doubling. If this point is at 10° in the nasal arc, the contractile power of that internus under neuricity from the third basal center of the corresponding side is 25° ($15 + 10$), and is not too great. Going beyond or falling short of these marks settles, for the operator, the question as to what muscle is to be operated upon and the kind of operation to be done in any given case of intrinsic exophoria or esophoria. Next the lift-power of the superior and inferior recti must be taken. To do this the prism must be set as for detecting hyperphoria and

cataphoria. Revolving the index into the arc of superduction to the point of doubling the test object, marks the lifting power of the superior rectus of that eye; likewise revolving the index in the arc of subduction to the point of doubling shows the lifting power of the inferior rectus of that eye. If there is hyperphoria of that eye the superduction should be greater than the subduction, and the quantity of each determines what shall be done for relief.

The duction power of the obliques can be determined only by the cyclophorometer in some one of its forms—better the triple rod instrument. But a knowledge of the duction power of the obliques is not so important as the duction power of the recti. Even in orthophoria it is well to know the duction of the recti. Every duction test shows the power of an individual basal brain center over an individual muscle. Some of these centers discharge a greater quantity of neuricity than do others, but all stand ready to work in the interest of binocular single vision; hence are properly under the control of the fusion faculty of the mind.

Still another test should be resorted to in cases on which operations are contemplated. This is the verting test. It should be applied only in the four cardinal directions. The means best for this purpose is the tropometer, but the perimeter is a fair substitute. The impulse coming from a conjugate brain center, both eyes are turned in the same direction when only one eye is under test. To eliminate any activity of a basal center, one eye should always be covered while the verting power of the other is being taken. If there is lateral orthophoria, right version of the right eye should be equal to the right version of the left eye, and the same may be said of left version and sub- and supversion. It is in cases of heterophoria and heterotropia that the verting powers of the two eyes are unequal. This test helps the operator to choose the method of operating and the muscles to be operated upon. If operations are not contemplated the version tests may be omitted, although the time necessary for such tests is short. All of the tests so far mentioned should be made when the eyes are uninfluenced by a mydriatic, and without either plus or minus spheres or cylinders being before the eyes of the patient.

Not until now is the patient ready for the mydriatic, but this becomes a *sine qua non* in the further investigation of the focal error or errors. To an audience of southern oculists argument in favor of using a mydriatic in refraction work is unnecessary. That any one should need such argument is astonishing. My means for many years has been homatropin hydrobromate. My method has

been to make a solution of one grain to each dram of water and to instil ten drops into each eye at intervals of three to five minutes between drops if the patient is less than 45 years old. Even in older people I use from one to seven drops, the one drop in patients beyond 60 years of age being intended for opening the pupil that the ophthalmoscope may be used for studying the lens and the fundus, for in these old people the ciliary muscles have lost all their power.

In five minutes after the last drop has been used I seat my patient at the ophthalmometer; after placing and leveling his head I then have one eye covered. My first study is the location of the anterior pole. For this most ophthalmometers are worthless. Only those are worth having which have a large black disc with an inch wide white circle near its periphery. If the patient looks into the center of the proximal end of the telescopic tube the white circular band is reflected from the cornea, the center of the reflected circle and the anterior pole coinciding. If this point happens to be the center of the corneal curve, the sharpest possible image will be formed on the macula and, other things being equal, the patient's vision can be made exceedingly sharp, whatever may be the kind and quantity of the focal error. But if the center of the reflected circle is far removed from the center of the corneal curve, a sharp image on the macula will be impossible; hence, full acuity of vision can not be secured by any lens. This image is studied, not by looking through the tube, but by looking above it.

The next step is to study the double images of the mires as to the relationship they bear to each other. In this study we locate the meridians of greatest and least curvature of the cornea and measure the difference between them, this difference being the amount of the corneal astigmatism, but often is greater than the total, especially at the beginning of the wearing of cylinders. In my own person the total astigmatism twenty-seven years ago was only about one-fourth that of what it is now, while my corneal astigmatism must have been the same then as now—certainly it is the same now that it was eighteen years ago, when my corneas were first measured with an ophthalmometer by the late Swan M. Burnett. My total astigmatism was not revealed until several years later. Now the corneal and the total astigmatism are equal. If Bowman's muscle were not endowed with power for correcting a part or the whole of the corneal astigmatism by tilting the lens, or if we knew some drug that would suspend the power of this muscle just as atropia suspends the power of Müller's muscle, then the ophthal-

mometer could be depended on implicitly in the work of correcting astigmatism. In spite of these facts, the ophthalmometer is wonderfully helpful, so much so that none of them can now be found in garrets.

This instrument enables the operator to tell his patient of the difficulties, if any, through which he must pass when beginning to wear lenses. If the best meridians are both vertical, or both horizontal, or if the two are parallel though oblique, there will be but little trouble to pass through. There will be still less trouble if these meridians diverge above even up to the middle point of the upper temporal arcs. But there will be great trouble if these meridians converge above, the trouble becoming increasingly great as these meridians approach the middle points of the upper nasal arcs.

The ophthalmometer will tell the same story both with and without the mydriatic, but it is better for the ophthalmometer to be immediately followed by the test case.

Even when there is no tilting of the lens by Bowman's muscle the astigmatism shown by the ophthalmometer is often one-half diopter less or more than will be shown by the trial lenses, more if the astigmatism is according to the rule, less if against the rule. This is due to the fact that the vertical corneoretinal meridian does not coincide with the vertical corneal refractive meridian. Though parallel with each other, the former corneal curve has a shorter radius than the latter. The horizontal corneoretinal meridian and the horizontal corneal refractive meridian coincide; therefore, both of these corneal curves have the same radius.

Having finished the measurements with the ophthalmometer, while the room is still darkened two other objective methods should be resorted to, namely, direct ophthalmoscopy and skiascopy. I must confess that I have never acquired that skill with the ophthalmoscope, in measuring errors of refraction, claimed by some of my confrères. Its reliability is greater if the patient's accommodation has been suspended, and without this artificial condition I would count it unreliable. Can the ophthalmoscopist be absolutely certain of the voluntary suspension of his own accommodation? With artificial suspension of the patient's accommodation and voluntary suspension of his own accommodation, the patient and persevering oculist may acquire accuracy in measuring errors of refraction with the ophthalmoscope. But, after all, the great value of the ophthalmoscope lies in the fact that it enables us to know whether or not there are disease processes going on within the eye. This

alone would justify the use of the ophthalmoscope in all of our refraction cases.

In skiascopy we find a most valuable method for measuring errors of refraction. It is valuable in all cases and indispensable in many, hence it may be resorted to with profit in all cases. In every case the patient's accommodation should be at rest. The cases in which skiascopy is indispensable are: (a) young children beginning to squint; (b) the amblyopic eye of older cases of squint; (c) all people, whether old or young, who do not know "their letters;" (d) all cases of amblyopia, whatsoever may have been the cause.

Of the two means, the plain mirror and the concave mirror, I prefer, and use only, the latter. I place the light always just above the patient's head and in the extended median plane, I regulate the height of my own and the patient's chair so that when seated we may both be erect with heads on the same level. I hold my 10-inch concave mirror always in my right hand and in front of my right eye whether the patient's right or left eye is under investigation. My rule is to test the right eye first, placing the left eye, for the time, under cover. Instantly the rotation of the mirror shows whether the light-and-shadow move with or against the mirror, and the assistant is at once directed to place the lens (minus or plus) that would look toward the reversal of the motion. Each lens is replaced by a stronger of the same sign until that one has been placed which reverses the movement of the light-and-shadow, in one if not in all meridians. If the reversal is in only one meridian the changes are continued until a lens of sufficient strength is reached for reversing the motion in the meridian at right angles to that in which the first reversal occurred. In each instance the strength of the lens has been noted and approximately the location of the meridians. To illustrate: without a lens before the eye the light-and-shadow moved against the mirror in all directions showing hyperopic refraction. A $+5$ reversed the motion at 90° , but a $+7$ was required to reverse it at 180° . The first thing shown by this record is that there is hyperopic astigmatism of 2 D., and that the $+2$ D. cylinder should have its axis at 90° . This is the excess of hyperopia of one meridian over that of other meridian. The next thing shown is that the better meridian (90°) is hyperopic 4 D. Therefore the lens needed is $+4.00 = +2.00$ cylinder axis 90° . If in this eye the light-and-shadow had moved with, instead of against, the motion of the mirror, and a -5 D. had reversed the motion at 180° and a -7 D. had reversed it

at 90° , the following would have been shown: Myopic astigmatism 2 D., this being the excess of myopia of one meridian over that of the meridian at right angle to; and that the — 2.00 D. cylinder should have its axis at 180° . The next thing shown is that the myopia of the better meridian is 6.00 D., hence the lens for that eye would be — 6.00 D. = 2.00 D. cylinder axis 180° . Not too much can be said in favor of skiascopy, but I must conclude this part of my paper by urging that every oculist make himself perfectly familiar with the science of skiascopy and that he make daily application of it in his practice.

I next place my patient by the test case and seat myself so that he is to my right. The test letters stand twenty feet distant and in a good light. The empty trial frames are now put on him and he is asked to call the smallest letters seen with distinctness. He is then told that the difference between what he now sees and what he saw before the drops were used is the measure of his strain. I then place the opaque disc before his right eye and ask him to call the smallest letter seen with his left eye alone. Two points in the record so far made are now noticed: first, did the preliminary test show a hyperopic or a myopic error? second, what was the ophthalmometric reading for this eye? The answer to the first question being "hyperopic" and to the last, "2 steps at 90° ." My first move is to place a + 1.50 cylinder, in the front cell, axis at 90° . The patient is again asked to call the smallest letters possible. I next take in one hand a + .50 sphere and in the other a + 1.00 sphere, and, holding them alternately in front of the cylinder, I ask which is the better, confirming his answer by having him call the smallest letters seen with each. If it be the + 1.00, I then put the + .50 back in the case and take a + 1.50 to replace it in the same comparative test. If now the patient sees better with the + 1.00, then this lens is placed in the cell behind the cylinder. I next ascertain if this combination is improved by the addition or subtraction of .25, by holding alternately in front of the cylinder a + .25 and a — .25 sphere. If with the former the letters are seen both blacker and sharper I remove the + 1.00 sphere from its cell, and replace it with a + 1.25. My next step is to determine if the cylinder is too strong or weak, and if it must be made either stronger or weaker the spherical must also be changed. To do this I first take a + .50 cylinder and hold it so that its axis shall correspond with the axis of the cylinder in the cell, and then I turn it so that the two axes shall be at right angles. The patient is asked to notice which position, if either, gives sharper vision. If neither, then the

cylinder in the cell is correct. If vision is better when the axes correspond, then a stronger cylinder is needed, but I do not yet know if the spherical part must remain the same or be made weaker. To determine this I now hold a — .50 cylinder in front of the eye, so that the axes shall correspond, and then turn it so that these shall be at right angles. If in the latter position vision is better, the first observation that the cylinder should be stronger is confirmed.

Next a comparison of the sharpness of vision with the two cylinders is made by holding the + .50 with axis coinciding and the — .50 with axis at right angles. If vision with the former is sharper the cylinder must be increased, but the spherical needs no change; but if the vision is better with the latter, then the cylinder must be increased, but the sphere must be weakened, each by .50 D. If the cylinder alone is to be changed, then the + 1.50 cylinder must be replaced by a + 2.00 cylinder, axis vertical; but if the sphere must be weakened while the cylinder must be increased, then the + 1.00 sphere must be replaced by a + .50. In either case with the combination in, the work is not yet ended. I next take a + .25 cylinder and go through the same steps as set forth in the use of the + .50 cylinder, and in like manner I take the — .25 cylinder, using it as I have already used the — .50 cylinder. If there is no improvement with either of these cylinders in either of the two positions, I know that I have the correct cylinder already in the cell. But if there is improvement with the one or the other I make a change of .25 in one way or the other, as already shown in connection with the + and — .50 cylinder. The strength of the cylinder determined, I next try + and — .25 sphericals alternately in front of the combination, and if neither improves vision the sphere in needs no change, but if the + .25 makes vision sharper, the + .50 sphere in the cell must be replaced by a + .75; or if the — .25 makes vision better then the + .50 sphere must be replaced by a + .25 sphere.

Whatever may be the error under study the same general method outlined above should be pursued. The examination of the left eye having been completed, the refraction of the right eye should be studied in the same careful methodic manner.

The complete correction of the eyes should be recorded, but this does not mean that these lenses should be given. If the lenses are plus, certainly they should never be made stronger, for "fogging" is an abomination. If there is esophoria far and near, a full plus correction is required. If there is exophoria far and near, or only

in the near, the full plus sphericals should never be given, for otherwise the exophoria would be made worse. But how to have lenses ground for any given case and whether they should be given prismatic effect for one or both eyes would furnish matter for another paper, and, besides, this one has already grown too long.

TREATMENT OF PARTIAL OPTIC AND RETINAL ATROPHY BY ELECTRICITY AND MASSAGE.*

(SECOND PAPER.)

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At the 1906 meeting, in September, of the American Academy of Ophthalmology and Oto-laryngology I presented a preliminary paper upon this subject, being the results of my experimental use of electricity and massage for about two years in cases of partial optic nerve atrophy. In this I went into the rather meager literature and gave five case histories. My experience during the following year has been considerably amplified and I am now prepared to fully substantiate the tentative claims then put forth, by both deductive reasoning and the results of clinical experience.

I have solved to my own satisfaction the certain points (*vide infra*) as to electrical and massage applications directed to the eye. In passing, I may say that these axioms have been for some time accepted by medico-electrical authors, but I had to prove them for myself before I got faith, and this is what each individual will surely have to do before he achieves confidence in this valuable therapeutic adjuvant, as it is well known that this agent has been given extravagant claims by irregulars and even by otherwise qualified enthusiasts. I stated, in closing the discussion of my 1906 paper: "Anybody making a contribution of this kind is placed in the position of the reporter who sends in 'news which is important, if true,' and that others must go into this before any stock is taken of electrical and massage treatment of atrophies of the retina and nerve."

Some of you, to my personal knowledge, have been stimulated to further investigation of these methods during the past year as the result of my 1906 essay. Some of you have seen one or more of my cases and have satisfied yourselves that the longed-for results I obtained in the five cases then reported, and in others subsequently treated, are not only authentic, but promise to be permanent. Certainly all of these cases were on the road to total blindness, although most of them had been subjected to full treatment by the ordinary means, but without result.

* Address to Pacific Coast Academy of Ophthalmology, Seattle, Wash., Sept. 10, 1907.

I claim that partial primary optic nerve atrophy, that atrophy consecutive to optic neuritis and to chronic retinitis, can be checked, the nutrition brought back to the nerve, the discs made to look more normal, the visual acuity and the fields greatly enlarged and the patient preserved as a useful member of society in the greater majority of cases. But the diagnosis of primary atrophy or partial degeneration of the optic nerve fibers at the ocular end of the nerve must be assured before a favorable prognosis can be given. One surely can not theoretically expect any effect upon the visual tracts or centers from an oscillation of the eyeball, a stretching and vibration of the optic nerve, which can not possibly extend further than the apex of the orbit. The same may be said of the local effects of electricity, for these are peripheral treatments.

Systemic treatment by alteratives, strychnin and general régime have been used in the majority of cases, but to these can not be ascribed the improvement, for all of these cases had been subjected to more or less full treatment by the ordinary methods before they were given the local massage and electricity.

ELECTRICITY.

The *continuous current* (*galvanism*) has the following effects:

The *anode* (positive pole) (1) is anesthetic, (2) sedative, (3) hemostatic and (4) feebly electrolytic, being less destructive than the cathode.

The *cathode* (negative pole) acts as (1) a stimulant, (2) dilates the blood vessels and lymphatics, (3) quickens absorption and (4) increases secretions. Both poles cause muscular contraction.

The interrupted current (*faradism*) has somewhat the same action, except as to electrolysis, there being a difference between the *low tension* (slow vibration) and the *high tension* (rapid vibration). Both cause contraction of muscular tissue and thereby exercise the muscular fibrillæ, producing increased nutrition and keeping up the life of the fibers and are, therefore, somewhat useful in external ocular muscle paralysis (and to this faradism has chiefly been limited), while we are endeavoring to remove the cause by alteratives, etc., or waiting for Nature to accomplish the same effect. Of course, there is no difference in the poles, as the direction of the current shifts from one to the other.

The *high tension* current is of greater clinical use than the low, for it is decidedly (1) anesthetic, (2) sedative, (3) stimulating, (4) increasing secretions and (5) lymphagogic, dilating the blood vessels and lymphatics.

Thus, theoretically and substantially as borne out in practice, the *anode* is useful in glaucoma, as it relieves pain, reduces tension and assists absorption; the *high tension faradic* current produces the same effects, and it is my custom to *combine the two*, either by alternate treatment or at one sitting, using the Victor wall plate, which is so formed that it delivers both currents at the same time.

In *optic nerve atrophy*, the disc is reddened by the cathode and particularly by the combined treatment, thus proving that nutrition is immediately affected. To ascertain this, take a patient with pallid disc, examined by the ophthalmoscope before and after treatment; also take his visual acuity and the visual field before and after, and satisfy yourself that the nerve is acted upon and the acuity and field increased by the treatment.

A *permanent effect* upon the optic nerve and retina as regards increase of function can not, however, be produced, except where the hyperplasia of connective tissue is confined to the ocular end of the nerve. Thus we can not expect any therapeutic result in descending atrophy from spinal sclerosis. Certainly, then, blindness from tabes and lateral sclerosis are just as unapproachable by ocular treatment as they ever have been. These cases belong to the general practitioner or neurologist, anyway, so the oculist had better beware of accepting such patients for treatment—but first assure himself of the diagnosis!

Atrophy of the optic nerve and retina in *retinitis pigmentosa* has been decidedly benefited in two cases (Cases 12 and 13), one of which during the previous eighteen years I have watched getting from bad to worse; one other case is now under treatment by Dr. Breckenridge, of Racine, Wis., after consultation with me, and has been apparently benefited by five months' treatment (Case 13).

One case of *toxic amblyopia* from tobacco is now under treatment and has been benefited.

OCULAR MASSAGE.

I have tried several forms during the last twenty years, most of them directed only toward removal of hyperplasia of the conjunctiva or corneal opacities and phlyctenular or interstitial keratitis, usually combined with boric powder, calomel, citrin or yellow oxid ointment.

The methods of massage vary; the finger tips, hard rolled pledgets of cotton dipped in oil and boric powder, the glass rod and ivory-tipped applicators in trachoma, the Bellarimow masseur (an ivory-tipped vibrator) in corneal affections, the various vibrators applied to closed lids, or the operator's fingers placed on patient's

lids and the vibration communicated through them to the eyeball in corneal and chorioidal affections, and mechanical oscillatory massage.

Forcible digital massage has been productive of good results in embolism of central vessels. Actual rubbing of the conjunctiva in trachoma and its sequelæ by various methods is a common form of treatment, as is also massage in corneal opacities. Digital and mechanical massage in glaucoma certainly reduces tension and is a recognized form of treatment.

Massage that will influence the nutrition of the optic disc and the ocular end of the optic nerve can only be effected by a method which will oscillate the eyeball rather forcibly; when this was first brought to my attention I looked at it as a rather dangerous procedure which might be productive of detachment of the retina or rupture of blood vessels, and hence should be viewed with suspicion.

As well as I can learn, such a method was in use first about 1900 by an irregular of Baltimore, who employed an "ophthalmo-oscillator" and advertised widely to the laity his extravagant claims:—I really believe he accomplished some good results! Muncaster, of Washington, reported four cases of optic nerve and chorioidal disease treated for two months by this application and claimed that the results were good; but this short time and so few cases is certainly insufficient to make any stand. (My cases have been under observation from one to three years.) I have seen and tried this appliance; it is certainly cumbersome and a dangerous instrument for indiscriminate distribution as it was sold by its inventor or agent.

Mechanical massage as given by the Victor transformer and Pyncheon attachment with cup vibrator seems to my mind to be the best, for they are easily kept clean, give uniform vibrations and the method is not particularly distasteful to the patient. The pump of the instrument is adjusted for a to and fro action, giving alternate compression and suction, thus pulling the globe in and out. The force or gentleness of the stroke is regulated by the thumbscrew on the piston rod, making it longer or shorter. There is a little hole in the handle of the applicator (a safety valve) which is covered by the operator's or the patient's finger during the treatment. Indeed, I have found that the applicator, both for massage and the electrode, is best held by the patient.

The reddening of the disc after treatment and consequent increase of blood supply and favorable effect upon the nutrition is proven and is more pronounced in massage than by electricity;

examine the disc before and after such application by ophthalmoscopy and you will oftentimes be surprised to note the congestion of the optic nerve.

GENERAL TREATMENT.

In the majority of my cases large doses of iodids and at times strychnia or other medication as indicated, together with regulation

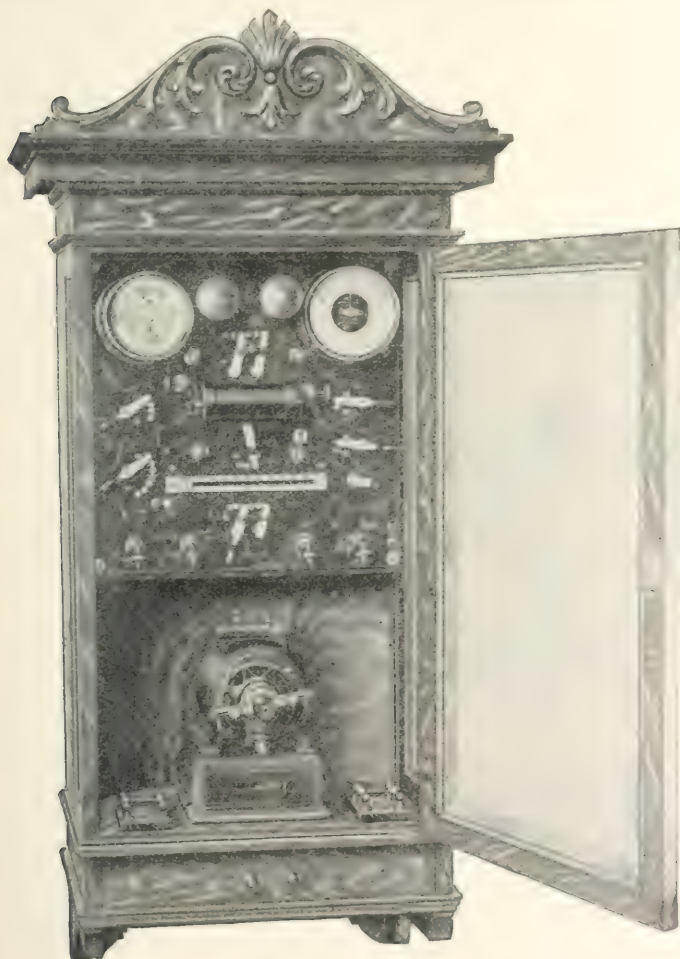


Fig. 1.—Wall plate.

of habits and diet, were likewise given. But I am sure that these were not the exciting or main factors of the cure or partial recovery, for in the majority these had been tried before without success. I allow these patients, and even encourage them, to use their eyes, believing that the exercise of the function of seeing by reading and

work is of value; their eyes are protected from sunlight by amber glasses when out of doors. In three cases—and these are the most marvelous ones—but little or no alteratives were given and yet two of them were relieved from almost total blindness to a life of usefulness.

METHODS OF APPLICATION.

The methods of application and the instruments are the same as in my 1906 article. The Victor Electric Company's wall plate, No. 2, has been found very satisfactory (Fig. 1). Our best results were obtained with the combined galvanic and faradic current and the high tension faradic. The former current is said by the makers to be peculiar to the Victor wall plate. The negative pole is applied directly over the eye and the positive is applied to the nucha. Our patients would tolerate from five to ten milliamperes; the duration of the treatment varied from three to five minutes every day or every other day. Such a treatment should be continued for weeks or even months. Galvanofaradization, so called by de Watteville, has the effect of giving increased volume to the faradic current and the refreshing action of the galvanic also tends to counteract any bad effect of overstimulation by the faradic current.

The *contraindications to the use of electricity* in ocular diseases are cases of iritis, iridocyclitis, or any acute inflammation of the eye.

Most of the authors employed digital massage, but we find that mechanical oscillatory massage easily supplants and is, furthermore, an improvement over the digital method (except where very powerful action is desired, as in recent embolism of the central artery), first, on account of cleanliness, as the rubber massage cup can be sterilized; secondly, more uniform vibrations are obtained, and, thirdly, it is less distasteful to the patient. We have for the past three years employed a rubber cupped massage handle, which receives its power from the Victor transformer, No. 2, and the Pynchon pump attachment (Fig. 2). The nipple of the pump should be at a point two-thirds distance to the right when we obtain vibration or alternate compression and suction. The force or gentleness of the stroke is also regulated by thumb pressure over the hole in the handle. Great care should be exerted that neither the length nor the amount of the stroke causes discomfort. In fact, the slower the stroke the better it is. We obtain the best results with 50 to 150 vibrations per minute. With the transformer and pump attachment the length of the stroke from 0 to $1\frac{1}{4}$ inches, and the length of the stroke desired can be selected by a gauge attached to the

crank pin. The rapidity of the piston stroke varies from 30 to 600 vibrations per minute.

Contraindications to massage are the same as in electricity, namely, any acute inflammation of the eye.

DURATION OF TREATMENT.

As to the length of treatment, I can not yet state when treatment should be discontinued; my cases are all under treatment yet. They have, as a rule, had about one month of daily treatment (six days a week), then tri-weekly to date for one to two years. Here I hear objections from my confrères as to the patients not agreeing to



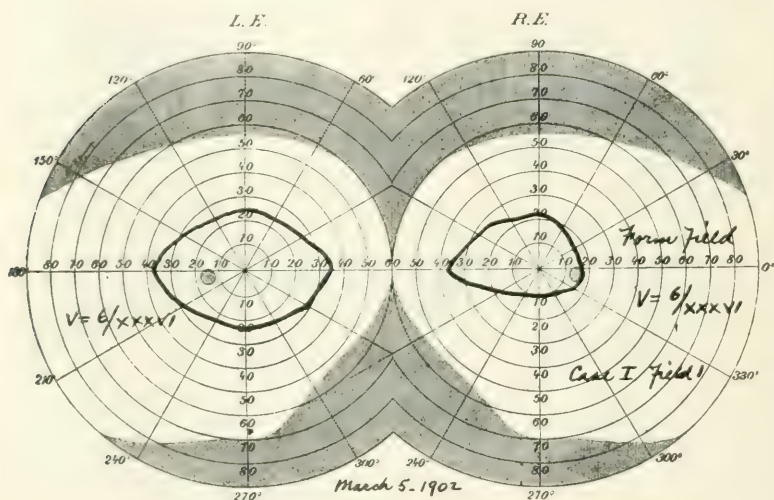
Fig. 2.—Masseur cup for eye.

such a long course or of the tediousness of the treatment, the expense and other patent objections. Well, I have had none from my patients as yet. These are the sick who grasp at any promise of relief, and, as they have, as a rule, had the recognized book treatment, under which they have progressed slowly or rapidly toward blindness, they have willingly subjected themselves to a lengthy trial of these therapeutic agents. The office assistant or the patient himself can apply the electrodes and the masseur, as well as the chief, so each application takes but little of his time. If he be willing to take a few poor people he will ultimately be rewarded by rather larger fees than for ordinary services by the well-to-do and certainly grateful patients. If it were necessary I could produce the most touching and grateful letters from some of my patients

and from consultants who have been most agreeably surprised at the results achieved by these applications and treatment, but such "proofs" are hardly customary in scientific literature.

CONTRAINDICATIONS.

The contraindications for massage and electrical treatment are any acute inflammation of the eye, for both methods excite hyperemia. The same may be theoretically said for the Biers hyperemia treatment, which is accomplished by tying an elastic band around the neck and allowing it to remain three to four hours daily. I have had no experience with this.



RESULTS OF TREATMENT.

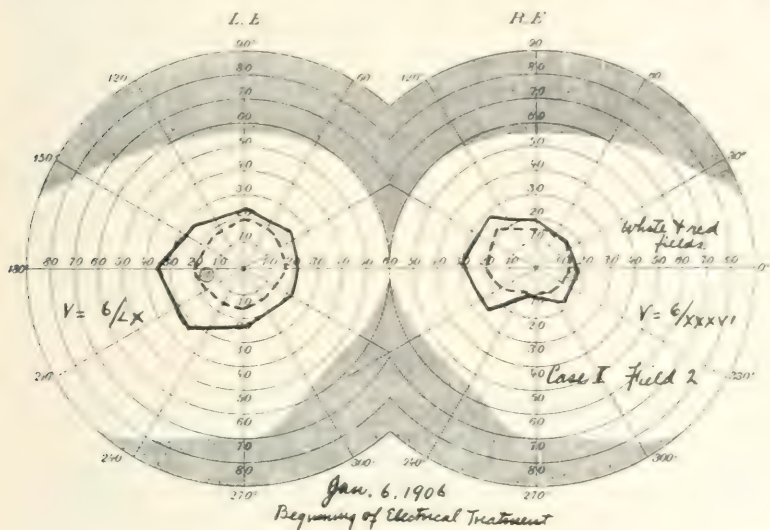
Now, as to the results of electricity and massage in optic nerve atrophy, my case histories speak for themselves. The increase in the visual acuity, the visual field and the marvelous restoration of the economic powers of the patient are shown in the majority.

CASES WHICH WERE BENEFITED BY TREATMENT.

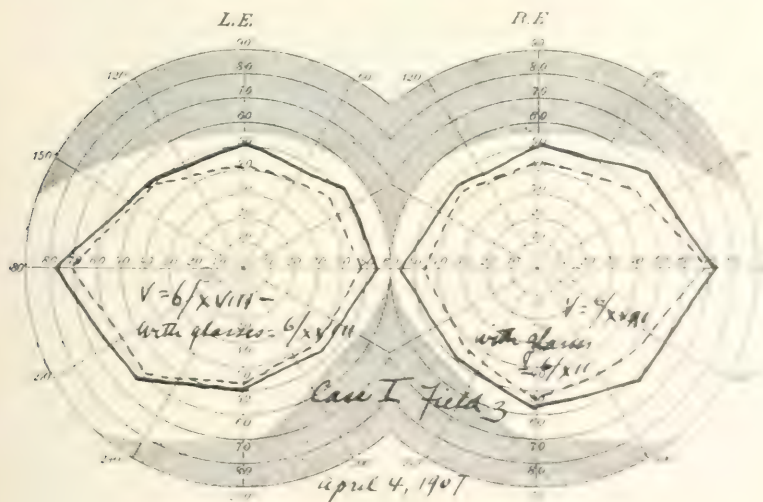
SIMPLE PRIMARY ATROPHY.

CASE 1.—Master R. R., aged 10. Seen for the first time March 5, 1902. Examination showed hydrocephalus white optic discs and rotary nystagmus. V. O. D. = 6/xxxvi; O. S. = 6/xxiv. Jan. 5, 1906, returned and gave the following history: Sustained a fall in June, 1905, causing an injury to the head, and was unconscious for some hours after the injury. Examination showed V. O. D. = 6/lx, of O. S. = 6/xxxvi. The visual field greatly contracted and vertical

nystagmus present. He was given a course of electrical treatments (the combined galvanic and faradic) for a period of ten days, at the end of which the V. of O. D. was 6' xviii. vision of O. S. was



6' xviii. Returned home. Feb. 20, 1906, began the second course of electrical treatment. Vision of the right eye 6' xviii, of the left 6' xviii. After fourteen days' treatment vision of O. D. =



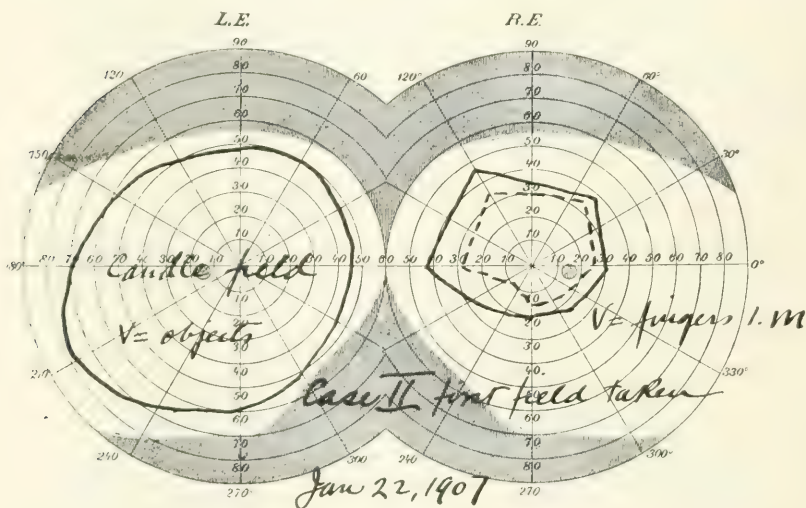
+ 6' xviii, of O. S. = 6' xii. Returned home. July 5, 1906, returned for a week's treatment. O² = 6' xviii. On leaving V. + O² 6' xii, and the visual field almost normal. Sept. 8, 1906, same

conditions prevailed. Dec. 1, 1906, V. O. D. 6/ix, V. O. S. 6/xxii. The same condition prevails. April 29, 1907, same condition prevails and no treatment given. Vision with glasses, V. O. D. 6/xii, O. S. 6/xviii. Patient feeling very good generally and has no symptoms from his eyes. Dec. 11, 1907, patient returned for course of two weeks' treatment, as he believed he was seeing somewhat worse and the nystagmus had returned. Visual acuity and field, however, about same as in April, 1907.

This is a case of purely primary optic nerve atrophy treated only by electricity and massage.

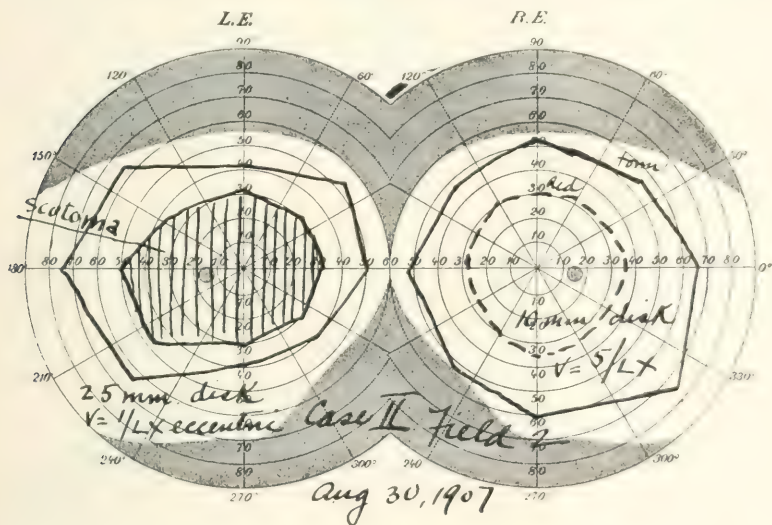
POSTPAPILLITIC ATROPHY.

CASE 2.—Miss A. B., aged 19, seen for the first time Sept. 24, 1905. Following history was obtained: Congenital lues, much



treatment, sight always poor and getting worse; blindness discovered one year ago at menstrual period; some of the sight returned, but on September 23 total blindness ensued after a suppression of menses; a saddle-shaped nose and other evidences of lues are seen. Diagnosis: Optic atrophy, both eyes; patient practically blind. On September 24 patient was sent to hospital for pilocarpin sweats and large doses of potassium iodid. She could not tolerate the sweats or moderate doses of iodid, so we decided to try electricity and massage. This treatment was given daily. On December 20 great improvement was shown and she walked around without stumbling and saw large objects. Feb. 6, 1906, now counts fingers when close to the eyes. June 15, 1906, counts fingers at ten inches from face. Aug. 24, 1906, counts fingers with right eye at 11½ feet and with the left at ten inches. November 1, gradual improve-

ment in sight. Visual fields enlarged. March 1, 1907, vision, right eye, 1/lx, left eye 0.5/lx. Visual fields enlarged. March 17, 1907, patient feeling badly in general. Eye condition remains the same. Prescription, syrup ferri iod. June 28, 1907, patient feeling well. Prescription, strontium iodid. Visual fields remain the same. Left for vacation. Aug. 1, 1907, word from patient says she is doing nicely. Aug. 30, 1907, patient returns from vacation, greatly improved in vision. Has picked flowers in the country, seen the stars at night and finds no difficulty in feeding herself at the table and reaching for various articles of food. Visual fields remain the same. V. O. D. 1.5/lx, V. O. S. 1/lx. Patient complains that at times she sees colored spots before the eyes. She has noticed this at infrequent intervals during the summer; otherwise she is very enthusiastic and talkative about her condition. She is.



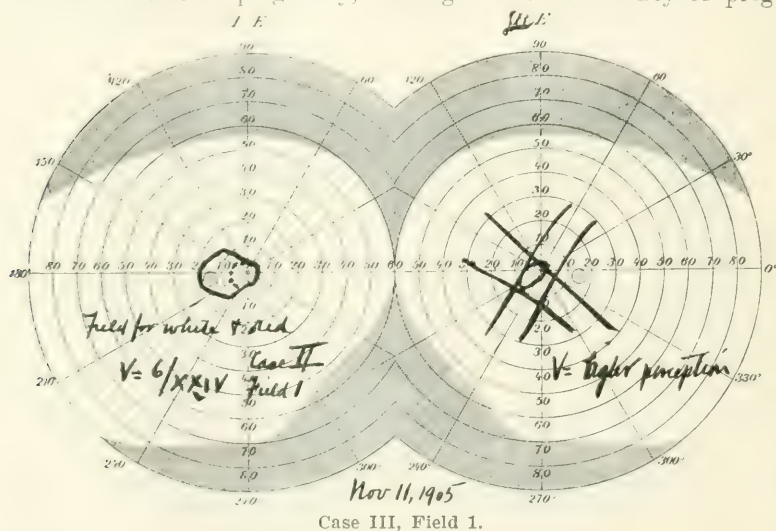
in fact, highly elated over the progress she has made and the apparent permanent hold that the treatment has upon her disease. Dec. 11, 1907, condition further improved. V. R. 1 lx. L. 5 lx.

This is a most remarkable case of postneuritic syphilitic atrophy, to which useful vision has been given in a totally blind person by combined treatment of (1) pilocarpin sweats, (2) mercury and iodids and tonics, (3) electricity and massage, to the latter of which I give the main credit. The patient had been under treatment by systemic medication for years previous to the time she consulted me, when she was totally blind; she had progressed from poor sight to blindness. The history of the suddenness of loss of sight is open to suspicion, as there were no signs of double so-called embolism, the nerves were pallid, the vessels of the disc contracted and they

are so yet; indeed, the appearances of the fundus show optic nerve atrophy even now of such advanced degree that the present functioning powers of the retina and nerve in view of their appearances is decidedly unique. Hysteric blindness may likewise be excluded. I think she will retain the present vision and acquire some more.

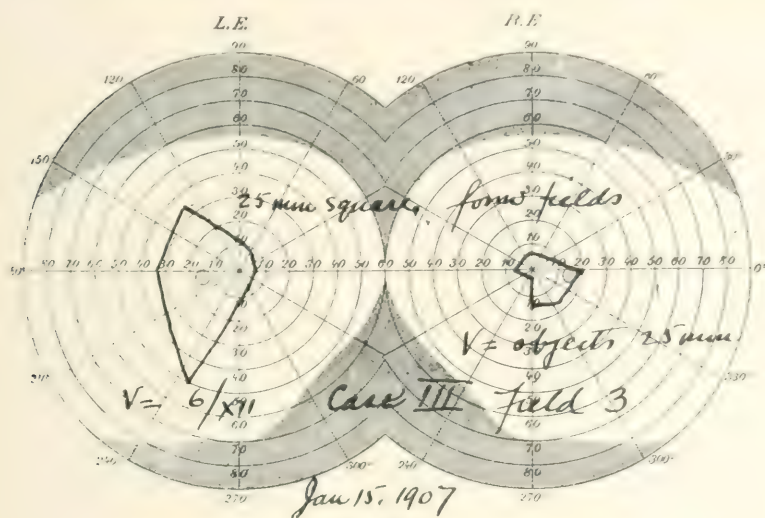
SECONDARY ATROPHY OF OPTIC NERVE AND RETINA FROM
ALBUMINURIC RETINITIS OF PREGNANCY.

CASE 3.—Mrs. A. W., aged 29, a congenital deaf-mute. The diagnosis of this case, as given by Drs. Brebeck and Hoffman, of Baden, Germany, is as follows: Physiologic toxic substances in blood as result of pregnancy, causing a so-called kidney of preg-



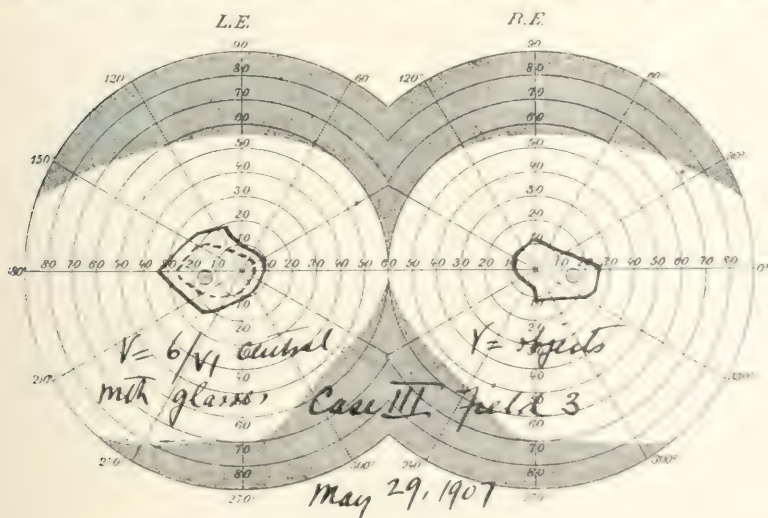
nancy, occasioning, owing to some cerebral predisposition, increased exudation of fluid in the ventricles of brain and resulting in a neuroretinitis. Has had iodids, strychnia, electricity, horse serum injections, etc., in Russia and Germany and gradually lost vision; was led into the office Nov. 11, 1905. Our diagnosis was optic nerve and retinal atrophy, both eyes. V. O. D. = movements of objects. V. O. S. = 6/xii. Advised the use of electricity and massage and general supervision by her physician, Dr. Al. Jenner, who gave several courses of iodids and strychnia. The electric and massage treatment was started Nov. 11, 1905, and continued daily thereafter, with the following results: Jan. 22, 1906, V. O. D. = fingers at 1 m., V. O. S. = 6/ix. May 1, 1906, has had electricity and massage three times a week for the past month. She says she can see a good deal better; visual acuity and visual field shows improvement. V. O. D. = fingers at 1 m., V. O. S. = 6/ix. Has

been collecting stamps and comes to the office alone. On June 26, 1906, returned from a month's sojourn in the country. Her condition now is about the same as when she left, except that the



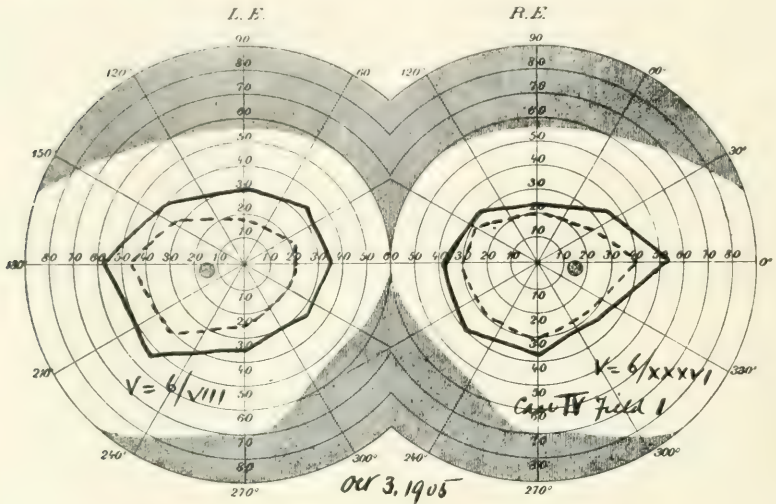
Field 2.

visual fields have increased slightly. June 27, 1906, V. O. S., 6/xii. Visual fields enlarged. Aug. 1, 1906, plano amber glasses. Jan. 15, 1907, vision 6/xii. May 29, 1907, O. D. = 1 lx, O. S. =



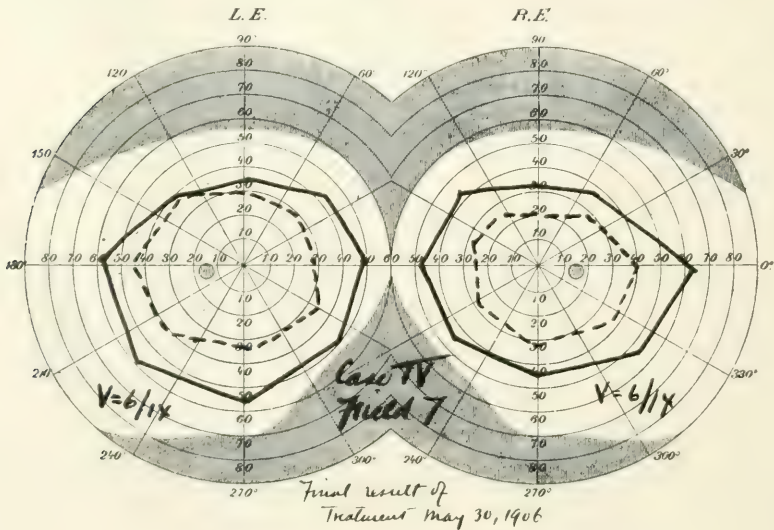
6/xii. She is now collecting postage stamps, walks about town alone, comes to office by herself and does all manner of reading. Some correspondence with her previous consultant in Dresden,

Germany, shows that case was deemed hopeless. In this remarkable case I believe the main benefit has been obtained by the long course of electricity and massage.



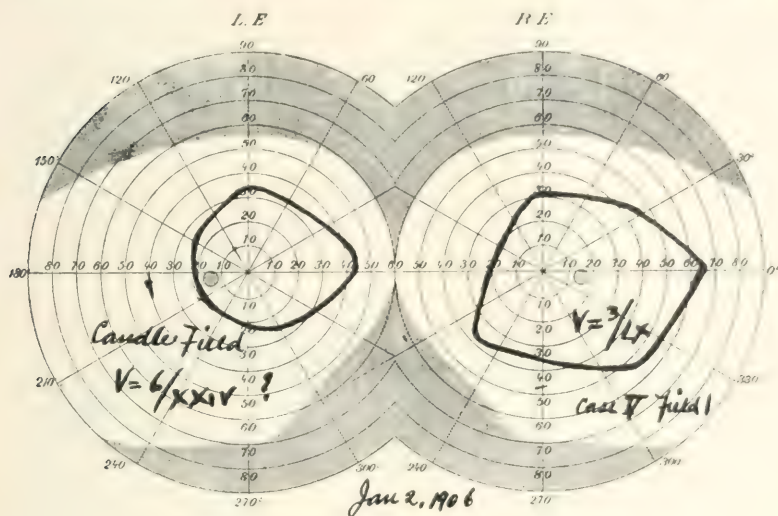
PAPILLITIC SYPHILITIC ATROPHY.

CASE 4.—Mr. W. McN., age 56, seen for the first time October 2, 1905, with the following history: Acquired lues with the initial

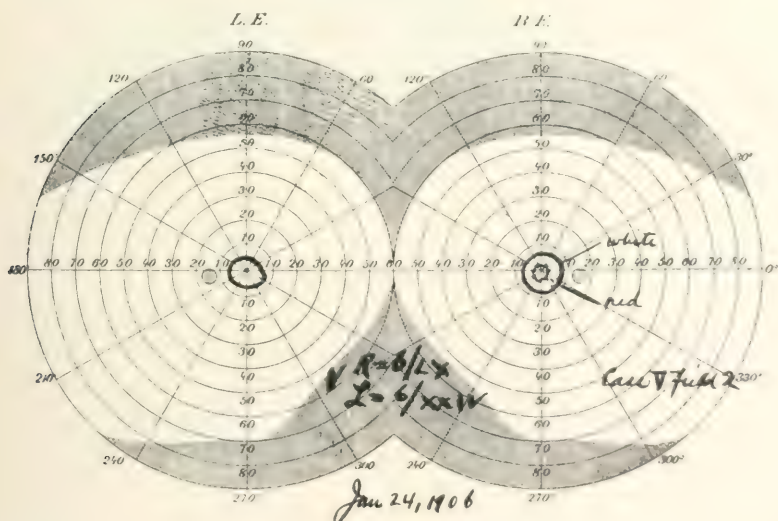


lesion appearing sixteen months ago; complains of gradual loss of sight for past ten days. Visual acuity as follows: O. D. = 6/xxxvi; O. S. = 6/ix. Sent to hospital for pilocarpin sweats, administra-

tion of potassium iodid and mercury inunctions; also electrical and massage treatments at the office. Returned home October 20, much improved. Returned for treatment on Dec. 11, 1905, with a



neuroretinitis of both eyes, but especially in the right eye. Visual acuity O. D.=6/xxxvi, O. S. 6/ix. Treatment given was as follows: Potassium iodid (teaspoonful of the saturated solution three

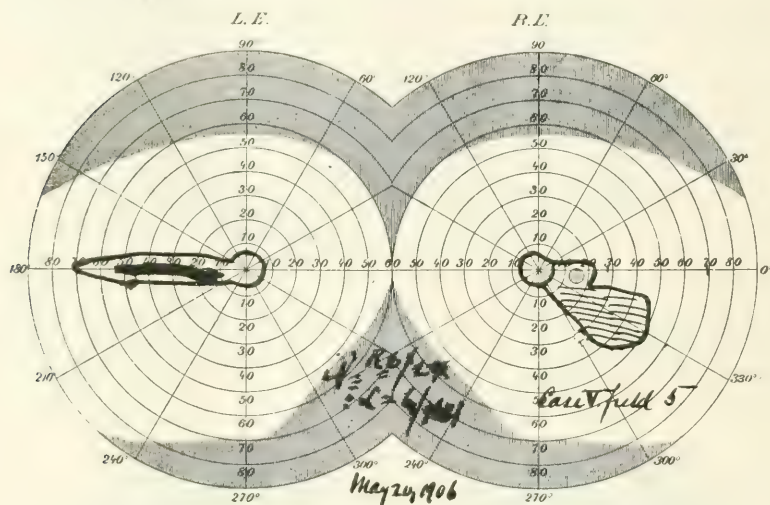


times a day) and the electrical and massage treatment. Returned home December 20, with improved visual fields and the visual acuity as follows: O. D.=6/xxviii, O. S.=6/ix. After nine

days' treatment with electricity and massage great improvement in the visual field and visual acuity. V. O. D. = 6/xii, O. S. = 6/ix. May 30, 1906, returned for a week's treatment, at the end of which vision in both eyes was 6/ix, and the visual field very much improved.

Patient has been taking iodids steadily. Last seen in April, 1907, when I was at Superior, Wis., in consultation. Then was attending to his business and was very grateful.

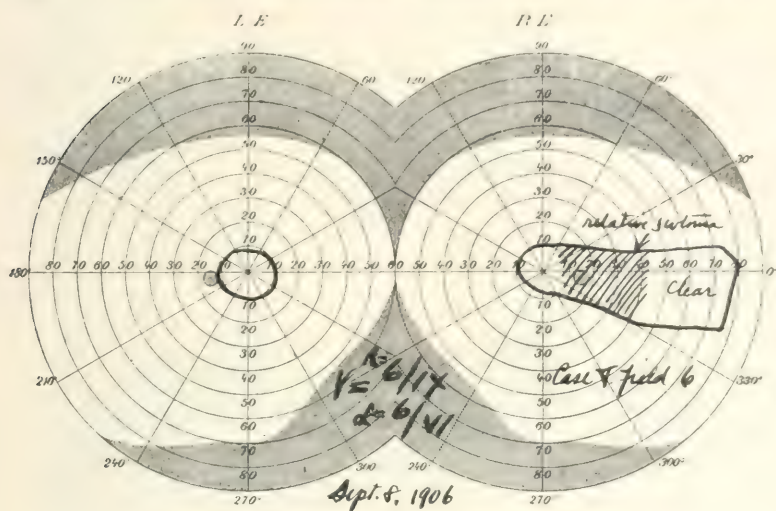
This case has had much iodid treatment, but each course of electricity and massage immediately benefited him and some of the results can be ascribed to the local treatment.



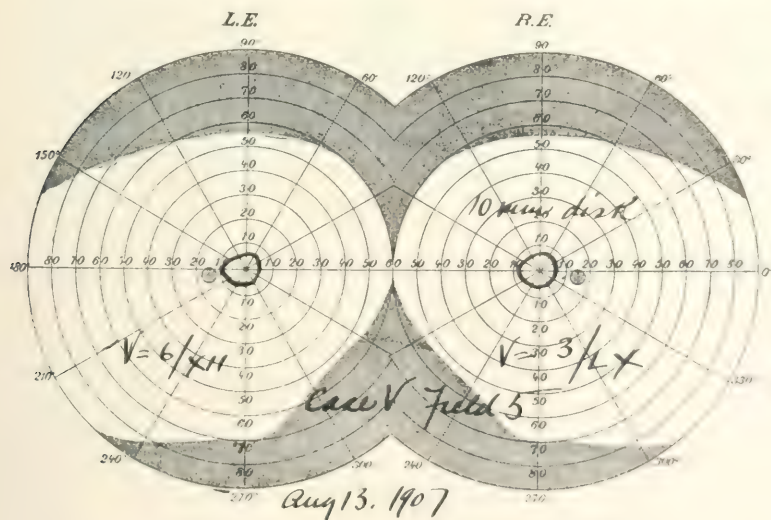
PAPILLITIC SYPHILITIC (?) ATROPHY.

CASE 5.—Mr. T. W., age 68, was first seen April 20, 1905, and upon examination the right eye presented a choked disc. The left eye has a clear pupil, but irregularly dilated with synechia. The right eye red and inflamed with the pupil small and regular. V. O. D. = 3/lx, O. S. = 6/xxiv. Specific history negative, but probable. Choked disc O. D. = 3 D. Treatment prescribed was potassium iodid and mercury; sodium salicylate, atropin, and dionin for the iritis, which speedily subsided. June 5, 1905, V. O. D. = 4/lx, O. S. = 6/xxxiv. Dec. 23, 1905, sent to hospital for pilocarpin sweats, large doses of potassium iodid, strychnia injections in temple, and he was given electricity at the office, but no improvement was noted after this heroic treatment. Returned Jan. 2, 1906, and we could only obtain a moderate field by means of the candle test. He remained until January 24 and received electric and massage treatments daily, with the following results: V. in

the right was 6/lx, and in the left 6/xxxiv; visual field improved. Feb. 9, 1906, after one week's treatment V. O. D. = 6 lx.



O. S. 6/xviii. Great improvement in visual field. March 10, 1906, V. O. D. = 6 lx, O. S. = 6 xvii. April 7, 1906, V. O. D. = 6 lx.

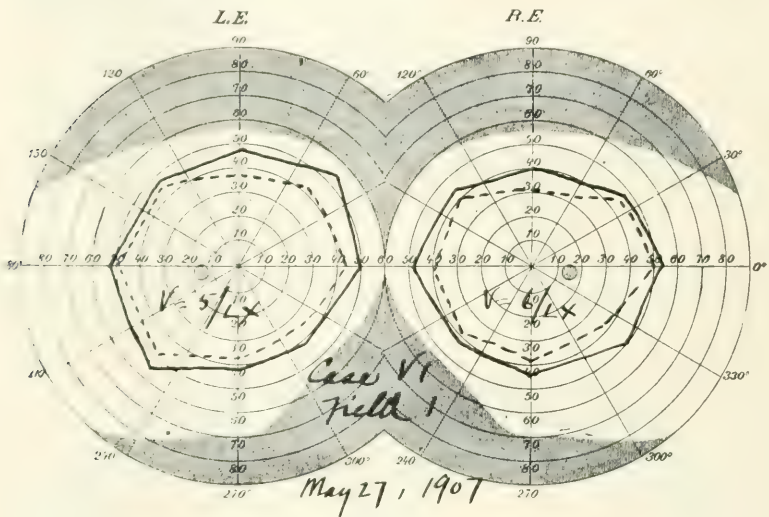


O. S. = 6 xviii, with both eyes 6 xii. May 26, 1906, V. O. D. = 6/lx, O. D. = 6 xviii. June 25, 1906, V. O. D. = 6 lx, O. D. =

NOTE.—Owing to use of some of the cuts from my 1906 article illustrating visual fields of the first five cases, the numbers of the charts do not exactly correspond in this article. The dates, however, show the proper sequence.

6 xii. with glasses and both eyes V. = 6 vi. June 28, 1906, V. O. D. = 6 lx, O. S. = 6 xii. Aug. 16, 1906, after one week's treatment of electricity and massage, a marked improvement in the visual fields noted. V. O. D. = 6 xxxvi, O. S. = 6 xii. Sept. 8, 1906, V. O. D. = 6/lx, V. O. S. 6/xxii. Vision, glasses right 6/ix, vision glasses left 6/vi. Feb. 4, 1907, V. O. D. = 6/lx, V. O. S. = 6/ix. March 14, 1907, V. O. D. = 6/lx, V. O. S. = 6/xiii. Vision right 6/xii, vision left 6/xii. July 13, 1907, V. O. D. = 3/lx, V. O. S. 6/xii.

This case has had much iodids and electricity—massage treatment. Would certainly have been totally blind under ordinary treatment by this time.



He has been enabled during the last two years to hold his position of register of deeds and to do office work.

POST-PAPILLITIC ATROPHY.

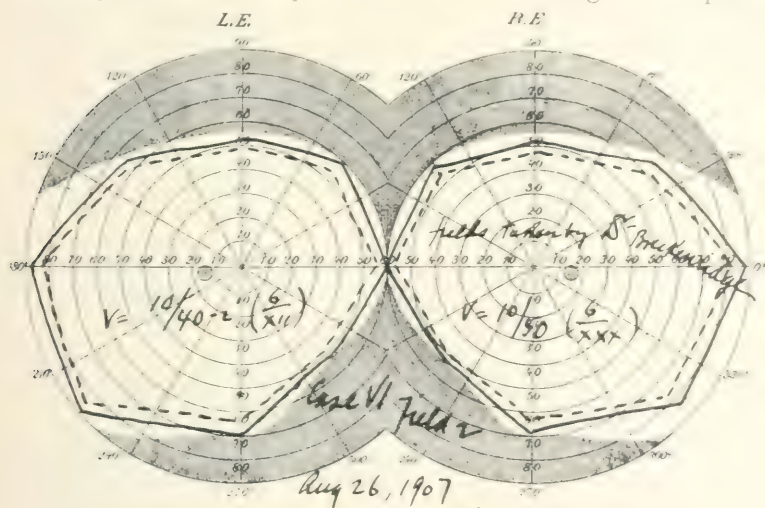
CASE 6.—Mr. C. L. B., age 67, traveling man. Fifteen months ago he noticed that he could not see as well as formerly. February, 1906, he fell on the ice, becoming senseless, eyesight worse. February, 1907, fell again, striking head; eyesight worse, but he was able to get along and did not receive any medical attention. March 4, 1907, can not see to read, but can see sufficiently to write ordinary orders. His sight is not much worse than it was a year ago. He wears glasses = 4.00, his vision O. Vision right eye O = 3/lx. Ophthalmometer shows astigmatism 50, axis 90°, tension normal. Diagnosis: Right optic neuritis, left optic neuritis and atrophy. May 30, 1907, V. = O 6/lx. Lenses do not improve distant vision. Ordered plano amber glasses. June 14,

1907, vision $O = 6/1x$. Treatment given in the office consisted of massage and electricity. Prescription potassium iodid. Massage and electricity is to be continued by Dr. Breckenridge, of Racine, Wis.

In June, 1907, he went to Indianapolis and consulted Dr. W. N. Sharp, who writes me under date of June 17, 1907:

"Mr. B., whom you wrote me about, was in this morning. From the history he gives, I should judge your method of treatment has been remarkably beneficial, as adjunct to the pilocarpin sweats and K. I. His vision is this a. m. $15/200 +$."

July 2, 1907, vision $O = 6/1x$. July 26, 1907, Dr. Breckenridge, of Racine, sent visual field and wrote that the improvement of the field and acuity were remarkable. Aug. 20, 1907, patient seen while traveling on the road, reports that he is continuing his occupation



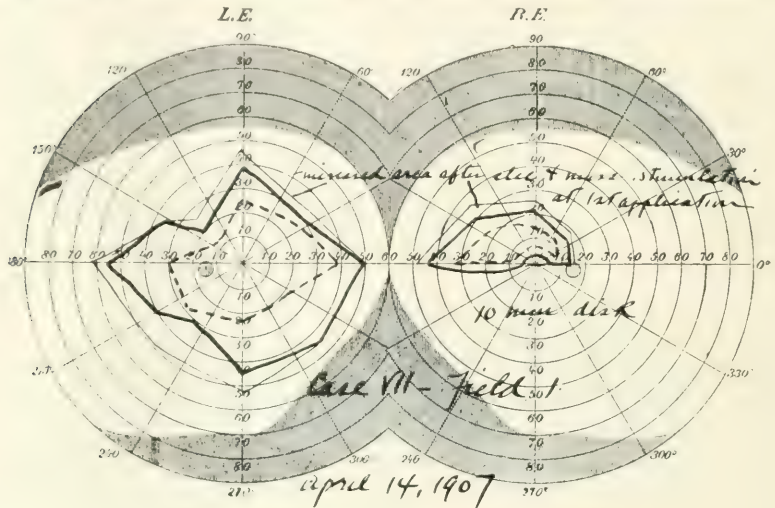
as traveling salesman for a saddlery and wholesale hardware house. Can read orders, see print and read signs. The improvement in visual acuity is not so great as that in the fields and the improvement of economic vision is vastly in excess of the record for acuity.

This is a case of apparently simple progressive atrophy attended by other lesions, possibly due to syphilis, probably following the injury. Iodids were administered, but the stimulation of the nerve and retina is the main factor that gave improvement in vision.

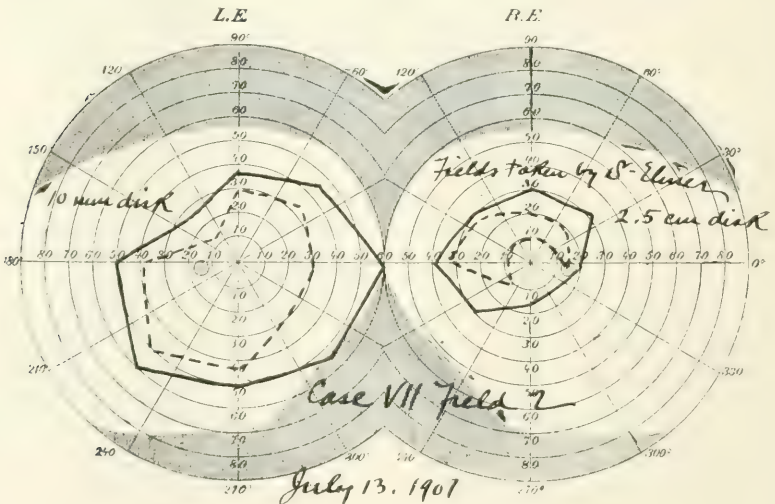
POST-PAPILLITIC SYPHILITIC ATROPHY.

CASE 7.—Mr. F. O. B., Davenport, Iowa, age 47, referred by Dr. Elmer, March 16, 1907. Optic nerve atrophy. Fifteen years ago original syphilitic lesion appeared as a mucous patch, apparently light secondaries. Full treatment for about two years. Vision right fingers at 1 m., left $3/1x$. Reads with hand glass

10 to 15 D. Was treated in Chicago, Milwaukee and other places. Could read print with ordinary glasses last September. Rapidly worse last six months. Advised high tension and massage. March 22, 1907, vision right fingers $1\frac{1}{2}$ m., vision left 3 lx. Returned for



massage and electricity April 1, 1907. Vision right fingers at $1\frac{1}{3}$ m., left fingers 3 m. 3/lx. Visual fields April 14, vision right

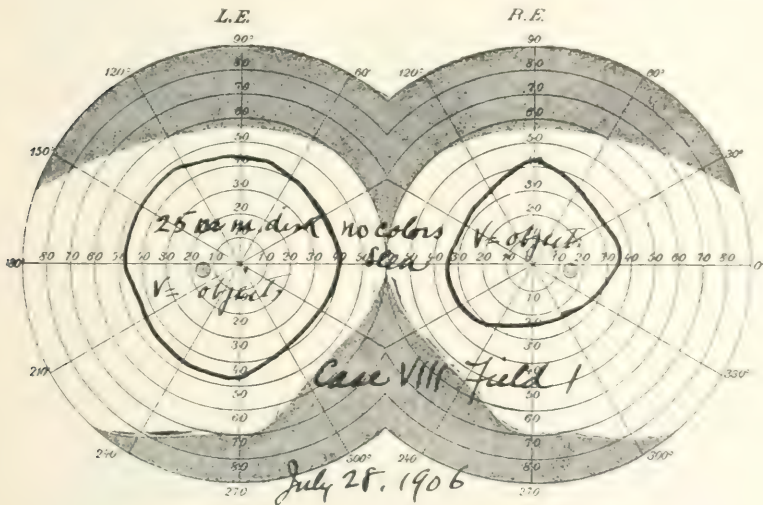


3/lx, left 5/lx. V. O. D. is eccentric. April 19, 1907, V. O. D. 3/lx, V. O. S. 3/lx. April 20 returned home.

He has received considerable regular treatment by Dr. Elmer in Davenport, who under date of May 17 wrote that the patient

had improved and was attending to his business at the head of a wagon factory, and sent visual field appended. Letters from Mr. D. substantiated this statement. Dec. 2, 1907, patient came to Milwaukee and was seen at my office. V. R. = 2/lx. L = 5/lx; reads ordinary print with hand reading glass. Attends to all his business.

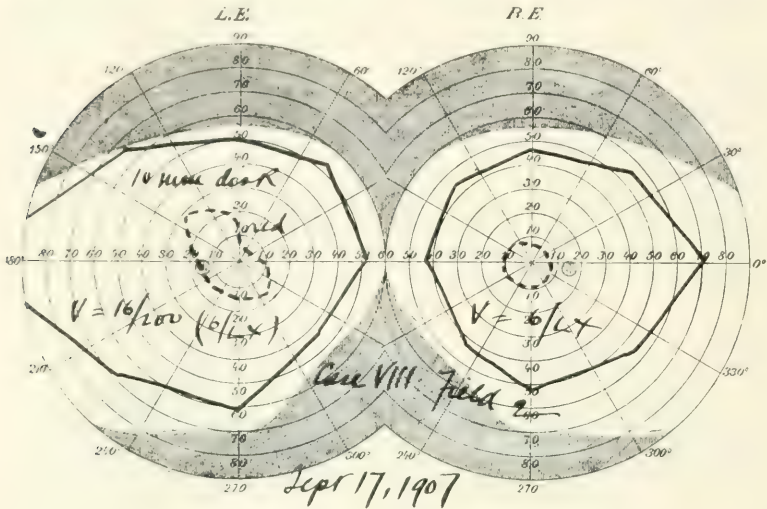
While the improvement in the right and poorest eye is certainly gratifying, the sight of the left did not improve either in acuity or field until Dec. 2, 1907. The vision has been somewhat restored in the right and held where it was in the left for nearly one year, whereas he rapidly lost vision for the six previous months, and thus we may conclude that the treatment has been beneficial.



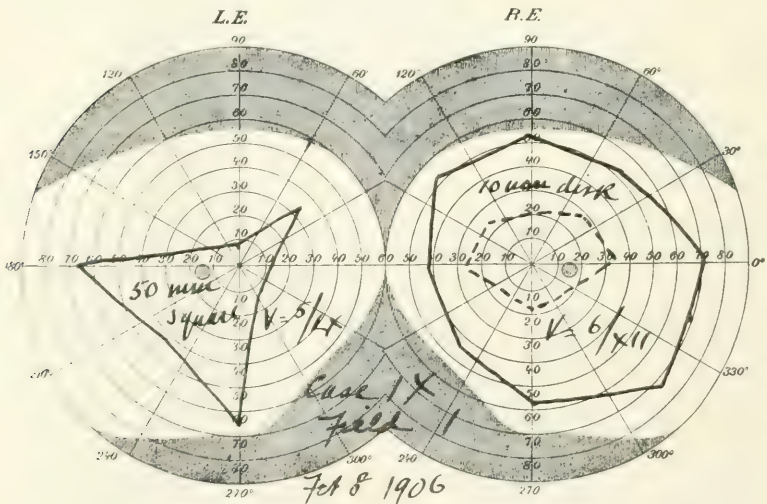
POST-PAPILLITIC (SYPHILITIC?) ATROPHY.

CASE 8.—Mr. F. G., July 27, 1906. Boilermaker. This man's vision had been failing for some time. One year ago he was struck in the left cornea with a chip of boiler steel $\frac{1}{4}$ by $\frac{1}{2}$ inch. This wound healed nicely, leaving only a fine corneal scar below the pupil. He consulted several oculists, some of whom said that he was born blind in the left eye and others made the diagnosis of optic nerve atrophy. Vision to-day is eccentric. O. D. fingers at two inches, O. S. fingers at one inch. Some improvement by + 3.00 spheres. Contracted visual field no colors. Lessened knee jerk. Advised potassium iodid, strychnia, electricity and massage. Aug. 15, 1906, vision O fingers 0.50 m. Jan. 25, 1907, vision O fingers 1.50 M. Recognized colors. Visual fields enlarged. March 1, 1907, V. O. D. fingers 1 m., V. O. S. fingers 1.50 m. V. F. May 1, 1907, idonucleoid 6-12-5 gr. tablets a day. May 22, 1907,

V. O. D. 3 lx. V. O. S. 2 lx. The case had no appreciable result for three months, but such decided improvement occurred then that he has gone back to work (June, 1907) at the boiler-mak-



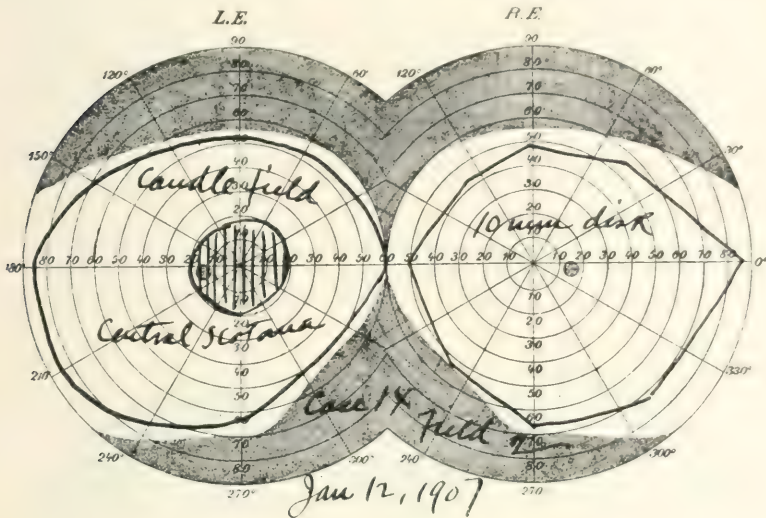
ing trade, having regained economic vision sufficient to raise him from the status of pauperism to that of a self-supporting producer. Dec. 11, 1907, at work; comes twice a week for treatment. (Note the remarkable return of the color sense.)



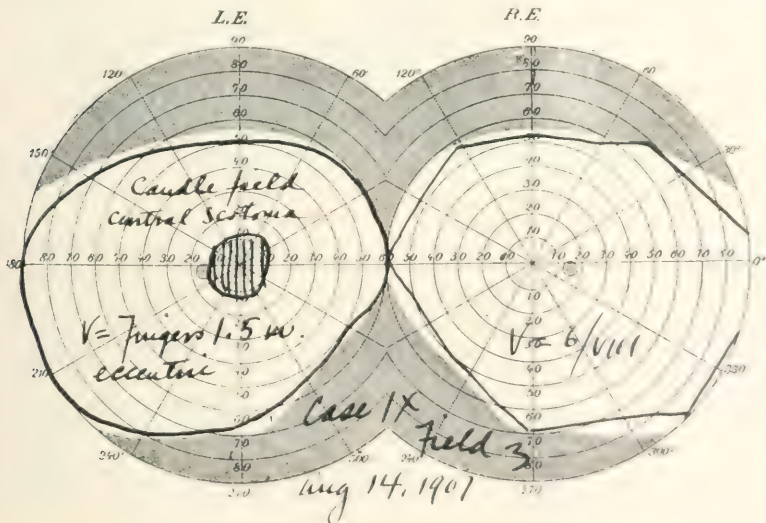
SPECIFIC RETINITIS AND SECONDARY OPTIC NERVE ATROPHY.

CASE 9.—Mr. G. M., age 41, came to the office Feb. 8, 1906, with the following history: Specific lesion thirty months ago; was

followed two months later by light secondary. Macular skin lesion and mucous patches on the tongue. Specific retinitis two years ago with a markedly lowered vision; ten months ago he was almost



blind and began potassium iodid and mercury, which he took steadily for nine months, together with hospital treatment from an oculist, when his sight greatly improved. To-day vision in the

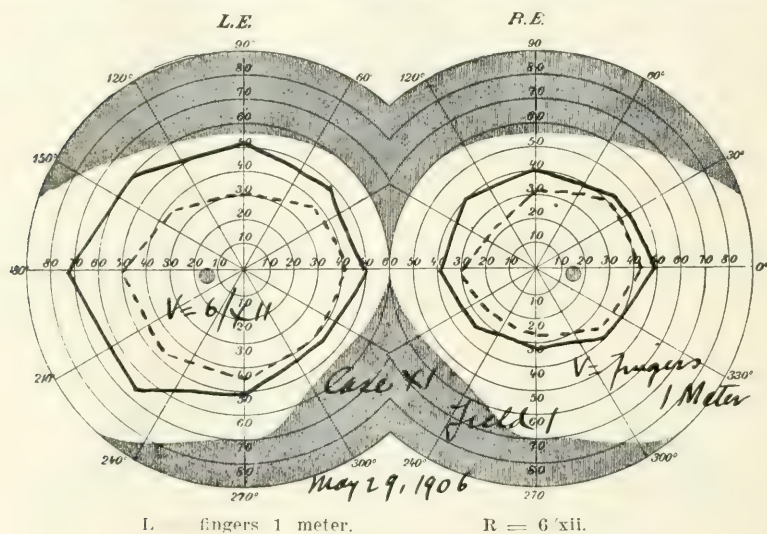


right eye is 6/xxii, left 5/lx. Hospital treatment, pilocarpin, mercury and dionin. February 12 right fundus is clear. February 23 patient sent home with prescription iodid potassium and advised

electrical treatments by Dr. Scheib, of Fond du Lac, who referred patient. July 9, 1906, V. O. D. 6 ix. V. O. S. light 5 m. November 13, atrophy left optic nerve. Strychnin injected. Dec. 20, 1906, V. O. D. 6 ix. O. S. = finger movements. Jan 12, 1907, V. O. D. 6 ix. V. O. S. fingers 1 m. Decided optic nerve atrophy left with central scotoma candle field, marked contraction of color field in right. Prescribed strontium iodid. Sept. 9, 1907. V. O. D. 6/ix, V. O. S. fingers 1 M. Sept. 14, 1907, after one week's treatment with massage and electricity, V. O. D. 6/viii, V. O. S. fingers 1.5 m. Visual fields enlarged.

OPTIC NERVE ATROPHY FOLLOWING THROMBOPHLEBITIS.

CASE 10.—Miss B., Dec. 19, 1906. Optic nerve atrophy right following thrombophlebitis of the left nasal vein and left superior



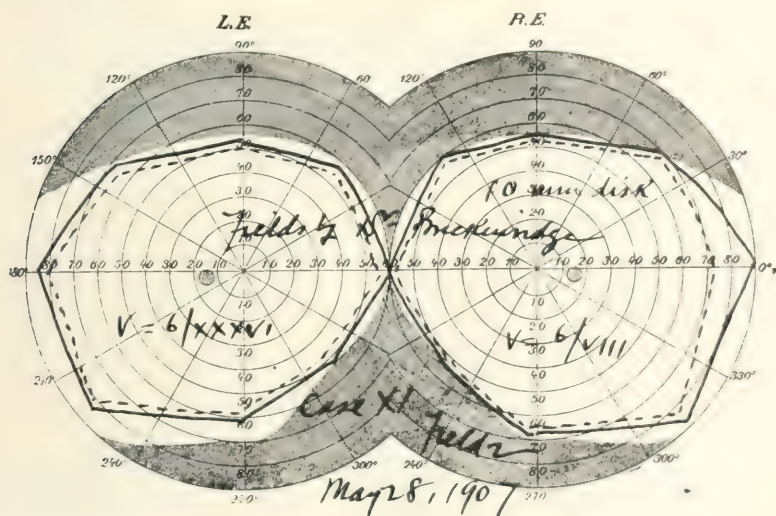
temple vein. Three spots of pigmentary deposits and degenerative changes over the macula. Headache, asthenopia, neurasthenic symptoms and dysmenorrhea. Left eye at one time turned out. Had operation on a left eye muscle six months ago. Vision now right 6/viii. left 6/xxvi. Cycloplegic examination shows low grade of hyperopic astigmatism in both eyes. Massage and combined electrical treatments instituted. March 23, 1907. V. O. D. = 6/vi, V. O. S. 6/xxiv. Visual fields normal.

This patient has been very irregular in treatment, although improvement has followed each course.

POST-PAPILLITIC ATROPHY.

CASE 11.—Mr. J. F. F., age 53, May 29, 1906. Referred by Dr. P. Jorgenson, of Kenosha, Wis., with the following history:

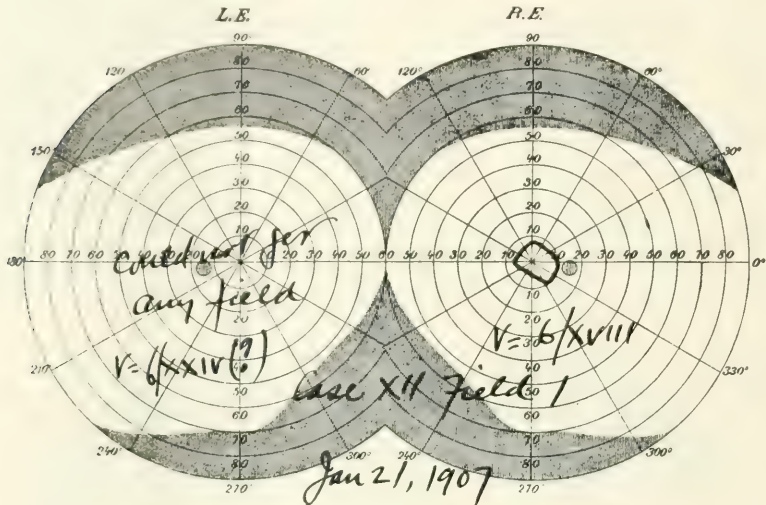
Vision is not as good as formerly, patient noticing considerable blur in the left eye for six weeks. Wears reading glasses. Personal history fair. Does not smoke, negative specific history. V. O. D. 6/xxii, V. O. D. fingers at 2 m. Ophthalmoscope shows considerable fundus right with optic neuritis and choked disc in the left eye. Prescribed potassium iodid. July 3, 1906, vision right 6/vi, left fingers at 5.00 m. Neuritis continues and there are many small hemorrhages throughout the left fundus. Potassium iodid continued. Sept. 21, 1906, V. O. D. 6/ix, V. O. S. 6/vi. Left disc choked. Right slightly congested. Oct. 13, 1906, V. O. D. 6/ix, V. O. S. 6/lx. Neuritis left remains. Advised potassium iodid and strychnia. Jan. 18, 1907, neuritis subsided. V. O. D. 6/ix, V. O. S. 6/lx. V. F. normal. Feb. 22, 1907, V. O. D. 6/vi, V. O. S. 6 xxxvi. Large visual fields. Neuritis almost gone.



March 3, 1907, V. O. D. 6/vii, V. O. S. 6 xxxvi. V. F. May 5, 1907, V. O. D. 6/viii, V. O. S. 6/lx. Optic nerve atrophy left. Patient sent to the hospital, pilocarpin sweats in the morning and electricity and massage in the afternoon at the office. After the second sweat V. O. D. 6/viii, V. O. S. 6/xxxvi. May 28, V. O. D. 6/viii +, V. O. S. 6/xxxvi. Electricity and massage daily. July 13, 1907, V. O. D. 6/vi, V. O. S. 6/xxxvi. Visual fields normal. Electricity and massage to be continued twice a week. Treated during summer by Dr. Bacon, of Kenosha, under my directions. Oct. 5, 1907, V. O. D. = 6/vi, O. S. = 6/xii.

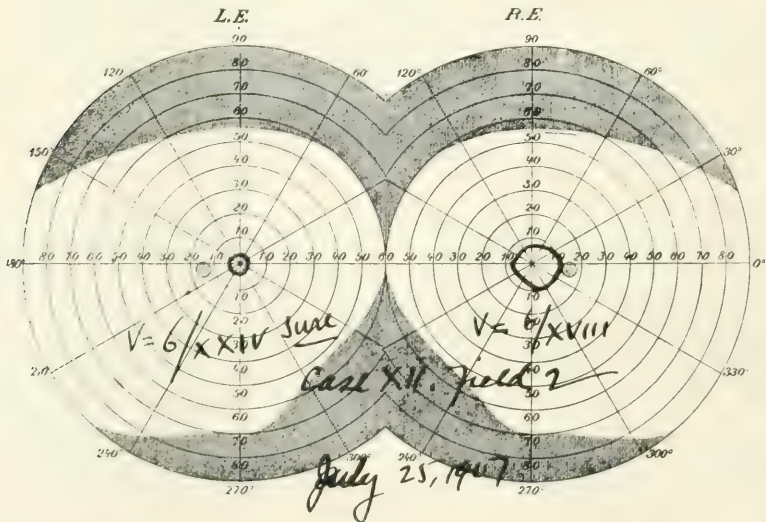
Treatment by the stimulating methods of electricity and massage was not begun here until what I esteem the best stage—waiting until the exudate into the nerve head had become absorbed—and this was materially assisted by the several courses of pilocarpin sweats.

I think that if we could guide our cases through their course in this manner most of them would recover with little or no loss of function. This I esteem to be my most successful case.



RETINITIS PIGMENTOSA.

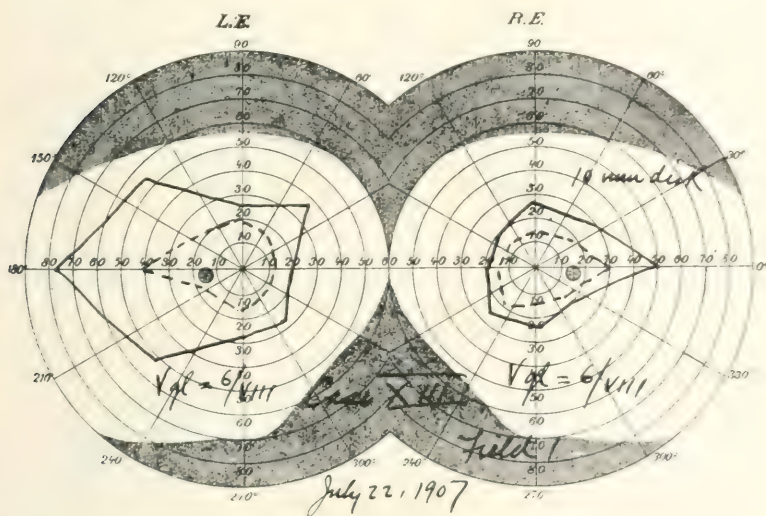
CASE 12.—Miss L. L., aged 22, Oct. 5, 1892. Progressive myopia retinitis pigmentosa. V. O. S. 6/xviii. Dec. 1, 1898, progressive



myopia, compound myopic astigmatism of the right eye, — 7.00 sphere combined with — 1 cylinder, axis 30°, and left eye — 5.50 sphere — 0.75 cylinder, axis 120°. Greatly contracted visual

fields. Patient married Oct. 28, 1906. Two children, 7 and 9 years. Marked atrophy optic nerves. Vision with glasses, O. D. 6/xxiv, O. S. 6/xviii. Began electricity and massage. Sept. 25, 1907, central V. O. D. 6/xxiv, V. O. S. 6/xvii. Nov. 15, 1907, claims to be able to go anywhere alone and does her housework.

CASE 13.—P. D., July 22, 1907, aged 21. Shipping clerk. Nyct-amblyopia retinitis pigmentosa. General health good. All brothers and sisters well. No night blindness in family. He has been wearing glasses and "doctoring" the last twelve years. Glasses are — 3.00 sphere \ominus — $\frac{1}{2}$ cylinder, axis 45° in the right eye and 135° in the left eye. V. O. S. with glasses 6/viii. V. O. S. without glasses 6/lx. Visual fields contracted. Advised electricity and massage by Dr. Breckenridge. Aug. 10, 1907, much improved.



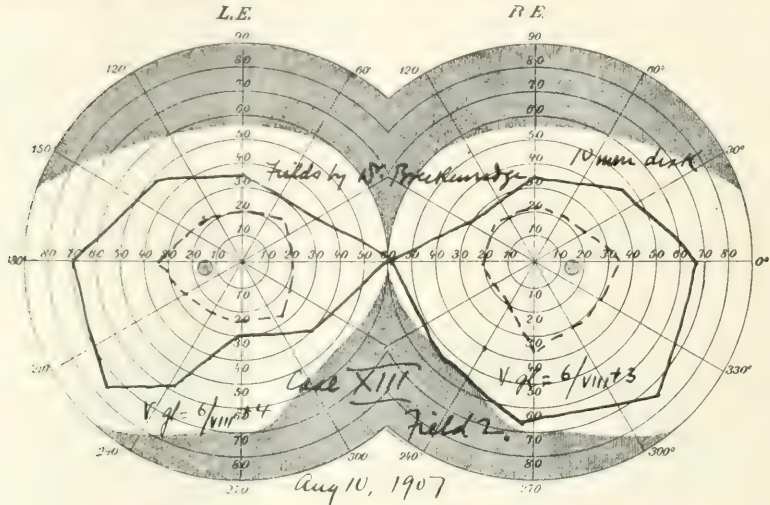
Visual fields enlarged. Patient himself says that he notices improvement. V. O. S. with glasses 6/vi.

To see a person gradually go blind during the course of years with such an affection as essential atrophy of the retina and optic nerve which hitherto has been deemed hopeless by even the most optimistic, and then to get an improvement in function, be it ever so slight, certainly lifts one out of the slough of therapeutic despondency to firm ground, on which one can stand and say that we have accomplished something unusual. Although improvement in two cases certainly does not establish the value of treatment, yet the results here achieved show that the methods are worthy of lengthy trial in other cases of hitherto hopeless retinitis pigmentosa.

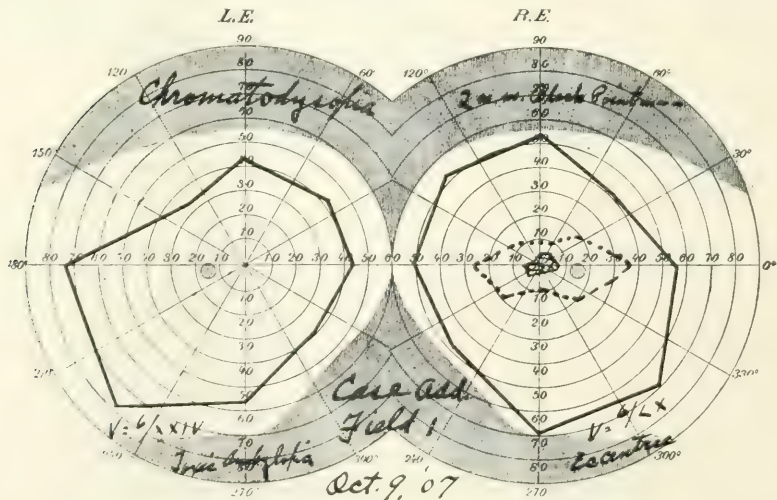
TONIC AMBLYOPIA.

CASE 17. (Added since address was delivered.)

Mr. J. H. G., aged 17, came to me first eight years ago with follicular conjunctivitis and asthenopia, exophoria, imperfect muscle



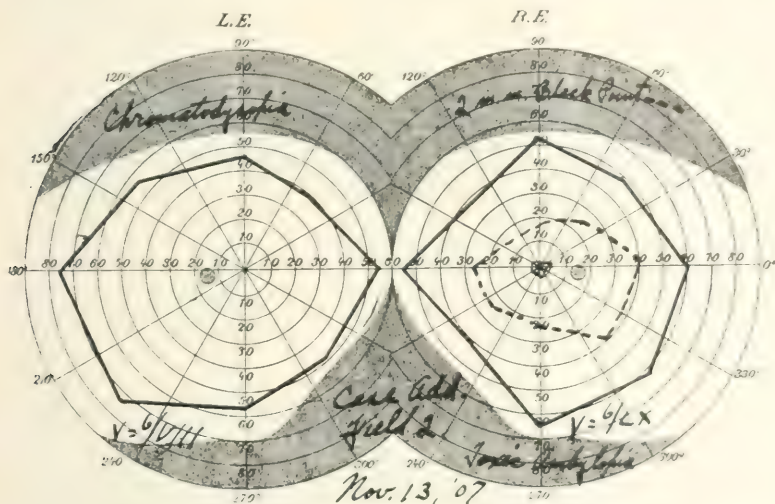
balance. V. O. D. 6/vi, V. O. S. 6/viii. Red-green blindness. Refraction examination under cycloplegia revealed 1 D. of hyperopia in both eyes. His last visit before he came to me for the present



trouble was on June 30, 1904, since which time he has been wearing + 0.62 spheres without eye symptoms. Oct. 9, 1907, he presented himself complaining of eccentric vision. This he had noticed during the last four months, and especially so in the right eye.

V. O. D. 6/lx eccentric V. O. S. 6/xxix, with $\times 1.50$ spheres, V. O. D. 6/xxxvi eccentric, V. O. S. 6/ix. There was the same low degree of exophoria and color blindness that was noticed on the occasion of his first visit eight years ago. Visual field is contracted and gives a central scotoma in the right with 2 mm. black points on the white disc. The fundus shows opaque nerve fibers and whitish nerve head, especially marked in the left eye.

He was advised total abstinence from tobacco and alcohol and given prescription for belladonna, nux vomica and gentian. Two days later treatment by massage and electricity was instituted. Oct. 22, 1907, V. O. D. 6/lx V. O. S. 6/xii. Visual field shows improvement. Nov. 13, 1907, contraction of the visual field is less restricted and the central scotoma with the black point in the



right eye is greatly diminished. Patient himself sees improvement and favors the daily use of massage and electricity.

This is the first case of tobacco amblyopia that we have subjected to this form of treatment and is yet, Dec. 15, 1907, under observation.

Dec. 11, 1907, V. F. increased, V. O. D. 6/lx, O. S. 6/viii.

CASES THAT SHOWED NO RESULT TO ELECTRICITY AND MASSAGE.

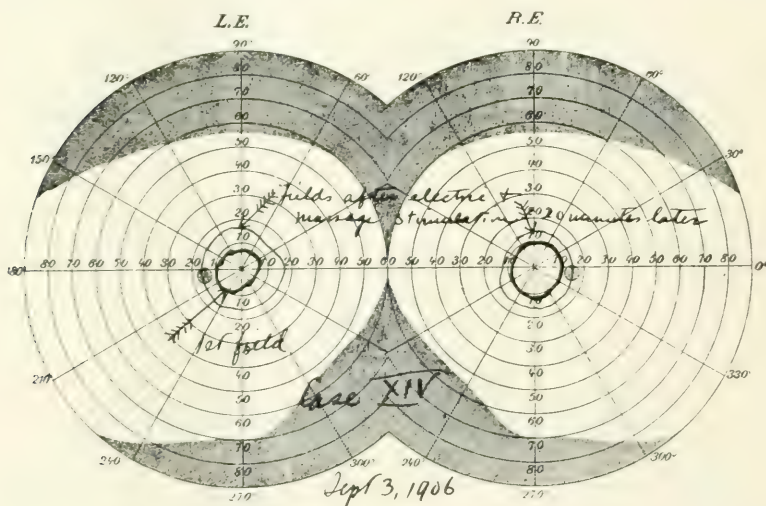
OPTIC NERVE ATROPHY FROM CEREBRAL DEGENERATION.

CASE 14.—R. K., Sept. 3, 1906, aged 63, physician. July 21, 1906, he had an insolation. At that time he could not count fingers; now he can not read or write. V. O. D. 6/lx, V. O. S. fingers 2 m. Visual fields contracted. Urinalysis negative. Electricity and massage. Dec. 22, 1906, no improvement. Jan. 21, 1907, patient said to have died of apoplexy. He took an overdose of morphin. Autopsy revealed softening of both sides of the brain.

The diagnosis of this case was in doubt. At first it seemed to be a simple atrophy. The postmortem only established the true diagnosis. Any form of curative treatment was here certainly hopeless.

POSTPAPILLITIC TRAUMATIC ATROPHY FROM CENTRAL (?) LESION.

CASE 15.—Mr. J. I., Sheboygan, Wis., aged 61, referred by Dr. Gretsich July 27, 1906. Fell on back of head and shoulder July 23, 1906. Was unconscious and ill afterwards. Optic nerve atrophy, gradually losing sight. Left pupil immovable. Vision, right, 6/vi, left fingers one inch. Visual fields, right, slightly contracted; left much contracted and no color vision. Advised K. I. and strychnia. Aug. 16, 1906, vision, right, 6/ix (?). Vision, left, fingers 1 m. Visual field, left, reduced. Sept. 15, 1906, vision, right, 6/vi; vision, left, finger movements. Oct. 9, 1906, vision,



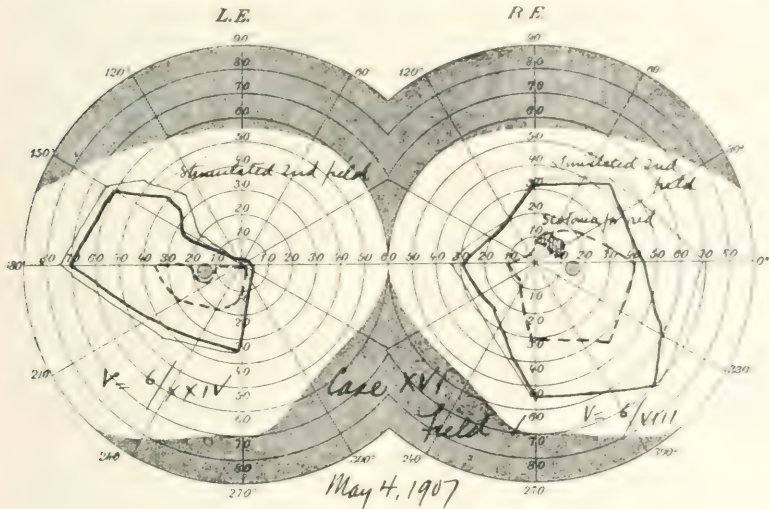
right, 6/vi; vision, left, fingers 1 m. Massage and electricity for three weeks. March 25, 1907, vision, right, 6/xxiv; vision, left, light projection; left, complete optic nerve atrophy. Right nerve congested, + 1 cylinder, axes 45° \subset 6/xxiv. Visual fields much contracted. I told him that the vision would be much worse by fall. Sept. 5, 1907, patient's vision is said to be still further reduced in the left eye.

In this case I thought that the lesion was probably intracranial and, as vision deteriorated under treatment, advised its discontinuance. I do not think it is applicable for this form of treatment.

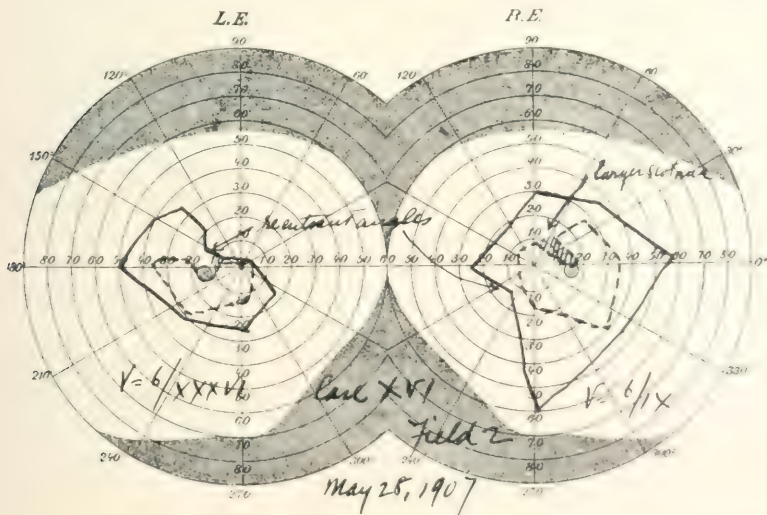
PROBABLE TABETIC ATROPHY.

CASE 16.—E. H. M., Los Angeles, Cal., aged 31. Secondary optic nerve atrophy, both eyes. Letter from Dr. Thorpe says that

vision of the right eye Feb. 2, 1907, was 6/vii, left 6/ix. April 7, 1907, vision, right 6/ix, left 6/xv. History negative. General health excellent. Argyll-Robertson pupil. No other evidence of tabes. Treatment same Feb. 2, 1907. Potassium iodid, 15 gr.



three times a day, full dose of strychnia. Electrical and digital massage. May 3, 1907, treatment began. Additional history on personal examination: Excessive sexual history nine years ago.



Suppurating bubo and possible chancre. Right side imperfectly lanced, later curettement. Urinated blood after ether. Physically was greatly run down; confined to room. Read a great deal, all night. Received no mercury, no potassium iodid at that date.

May 4, 1907, urinalysis, clear amber color, acid reaction, sp. gr. 1020. No albumin, no sugar. Epithelial cells. White blood cells; few hyaline casts.

I wrote his physician, under date of May 8, that his case was optic nerve atrophy. "I am of the opinion, however, that this is specific, as I get history of possible chancre and suppurating bubo, which at the time, however, was said not to be syphilitic. I get somewhat similar history in so many of these cases that ultimately yield to specific treatment that I am always skeptical of the rectitude of previous diagnosis. I find that the experimental treatment by electricity and massage congests the optic nerve very nicely and that stimulation of the high tension faradic and galvanic electricity temporarily increases the visual field. Therefore, I am of the opinion that we may get some beneficial result by a course of such treatment. I have continued his iodid in large doses."

May 15, 1907, refraction tests under cycloplegia show emmetropia in both eyes. Vision June 20, 1907, last examination, right eye 6/ix, left eye 6/xxxvi. Visual fields. Advised mercury and hypodermic strychnin.

June 27, 1907, I wrote to Dr. Thorpe: "The six weeks' study I gave to the case of E. H. M. and the result of treatment showed to my mind that it is not a case of primary optic nerve atrophy. I certainly get suspicious specific history in regard to the excessive sexual history and the suppurating bubo and possible chancre nine years ago. He has been to a number of physicians here and in Chicago and gets various opinions as regards the existence of tabes and its precursor of syphilis. He certainly has some incoordination of the lower extremities, lessened knee jerk and not a normal walk. There are some lessened sensitive areas of skin on his back.

"The result of treatment here was negative, except that it possibly lessened the severity of the disease or deferred the ultimate outcome. He has had very large doses of iodids and pilocarpin sweats, together with the local eye treatment of massage and electricity. The visual acuity, when he came in, was R. 6/viii and L. 6/xxiv. The vision at last examination was R. 6/ix and L. 6/xxxvi. Visual fields are lessened. I send you copies of the visual fields taken during course of treatment.

"I have advised him to go under thorough mercurial treatment and also to take hypodermics of strychnia in increasing doses down to one-half or two-thirds of a grain, and to keep this up for six weeks' or two months' course.

"This kind of case is certainly a doubtful one, but to my mind it is not primary optic nerve atrophy, and, therefore, not to be influenced by any local treatment, except that the stimulation may temporarily increase the vision, as was noted on my first visual field sent you."

This case will probably progress to the usual type of tabes dorsalis with progressive loss of vision. The reentrant scotomas or angles in the visual fields are indications of progressive atrophy. The treatment by massage and electricity proved of no avail, as the changes in the optic nerves undoubtedly affect more than the disc—beginning in the spinal cord and descending to the eye, such cases respond to no treatment. I would not advise treatment of tabetic atrophy of the optic nerves by these or any other local means. All such cases have in the past progressed on to blindness if they lived long enough, and undoubtedly will pursue the same course in the future.

A number of other cases, eight or ten, of optic nerve atrophy from spinal causes or too far advanced to warrant treatment were seen in private practice and a considerable number examined in public hospitals, but not treated.

The first fourteen described cases all improved, the atrophic process and loss of function being checked, and here it is believed that the connective tissue proliferation is confined to the retina and disc, not extending beyond a few mm. into the nerve, thus allowing the remaining neurons to functionate more freely after nutrition was re-established. The last three cases were inapplicable for any treatment, but the diagnosis was in doubt until a considerable study of the case had been made.

These fourteen cases are among the few reported cases of optic nerve atrophy that have improved under treatment, and in these the improvement is ascribed mainly to the betterment of the nutrition of the retina and optic nerve by the electricity and massage.

Improvement or cessation of the loss of vision can only be hoped for in partial primary atrophy or that following papillitis, and the diagnosis of these conditions must be assured before a prognosis should be given.

The treatment should be thorough and long continued—for at least one year. It must be given with proper apparatus by competent hands.

Electricity and massage are of value for stimulation of atrophic structures.

By the use of improved instruments the methods are facilitated and should be used by all regular practitioners.

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A PRELIMINARY STATISTICAL INQUIRY INTO THE
REFRACTIVE AND SOME PATHOLOGICAL CON-
DITIONS OF THE EYES OF FIVE HUNDRED
MEN ABOVE SIXTY YEARS OF AGE

IN THE NATIONAL MILITARY HOME, NEAR DAYTON, OHIO, EXAMINED
UNDER HOMATROPIN, TOGETHER WITH FOUR HUNDRED
AND FIFTY-FIVE BLOOD PRESSURE RECORDS.*

D. W. GREENE, M.D.
DAYTON, OHIO.

This paper is largely a statistical inquiry into the eye conditions and blood pressure records of 500 men over 60 years of age, with an average age of 70.76 years, inmates of the Central Branch of the National Military Home, near Dayton, Ohio, of which I have been a medical officer for twenty-three years.

This branch cared for 6,974 men during the year ending June 30, 1906. Of this number only 435 were under 60 years of age; the average age of the whole number was 67 years. There were 475 deaths, the average age of decedents being 70.83 years. The ratio of deaths per thousand was 63.11. It is not believed that a like number of men can be found anywhere, considering physical condition, age, uniform surroundings and under such control that an examination of the kind to be reported can be made. Hence the opportunity is exceptional. Because disability of some kind must be shown to entitle a man to admission to the Home the average physical condition of the inmates is not good. They were recruited, as a rule, from the middle and lower laboring classes, which from 1861 to 1865 made up the bulk of our rural population. The hard lines of laborious occupations and vices have left their impress on the constitutions of the men whose vitality had already been sapped by the stern realities of war, gunshot wounds, poor and insufficient food at times and exposures of all kinds. From the class of material described 500 complete examinations have been made. By complete I do not mean that I have gone exhaustively into all possible intra-ocular conditions and constitutional states. The paper does not contemplate this. The purpose is to show by abundant statistics what pathological eye conditions have been observed in a large number

* Read at the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, held at Louisville, Ky., Sept. 26-28, 1907.

of old men, and their proportion to the total number, rather than an attempt to define all the pathological conditions on which the disease states have depended or to attempt to reach conclusions concerning them from the blood pressure records. The writer regrets that it has not been possible to have a careful physical examination of the heart and an exhaustive examination of the urine made in every case, and also that in all cases with a blood pressure above 160 a record was not made as to the depth of the anterior chamber, tension of the globe, etc. The association of these last-named conditions with glaucoma is generally admitted, but further study as to the rôle played by arterial sclerosis with high blood pressure in its etiology is desirable.

The men examined have not been selected; most of them have been taken as they came to the clinic for eye and ear treatment from the camp. These represent the best type of men physically that we have. A large number have been sent in by the assistant surgeons from the main hospital and out-wards. These represent the worst type of men, from a physical standpoint, as they are all hospital patients, suffering from all manner of diseases and disabilities. The two classes, however, will give a fair average of the physical condition of the inmates. While no selection of cases has been made, certain men have been rejected as not fit subjects for the examination for the following reasons:

1. Not having attained to 60 years of age.
2. A want of sufficient intelligence to appreciate what was being done, and inability to answer the questions asked. Some have rejected themselves by refusing to have the mydriatic instilled.
3. No case has been accepted unless a satisfactory view of the periphery of the lens, the vessels, and the details of the fundus could be seen in one or both eyes.

My personal attention has been given to the details of every examination, except blood pressure records, which have been taken in the vast majority of cases by my assistant, Dr. H. A. Slusser, of the medical staff of the Home.

All blood pressure records presented in these statistics have been taken with the Janeway instrument, with 12 cm. cuff and between 2 and 5 o'clock in the afternoon, when the light mid-day meal had passed out of the stomach and intestinal digestion was well advanced. It is not believed that the increase in pressure (from 10 to 30 degrees) often observed after a hearty meal will obtain in these men whose diet, while nutritious and wholesome, is simple and plain. Every test has been made on the left arm when possible, and

in the sitting posture in every case, the arm on the level with the heart. Two or three tests have usually been made and the reappearance of the radial pulse has been the basis from which systolic pressure has been read; diastolic pressure has also been taken regularly, but it has little additional value in these records, which have been taken for diagnostic, not for therapeutic purposes. Four hundred and fifty-five records have been taken with an average systolic pressure of 163.6, and, while they have only been taken once, it is not believed that this will materially lessen their value, especially in the (pathological) cases with a pressure of 160 and upward. Continued high pressure can never exist without hypertrophy of the heart which, when once established, is constant and is not subject to wide fluctuations from day to day, so that for our purpose one examination would seem to be sufficient. It only falls when dilatation and broken compensation are reached.

Among those who use the sphygmomanometer there is not as yet complete agreement on what may be considered normal blood pressure; age, sex, occupation and other factors influence the height of the blood pressure in normal individuals. Therefore, we can at present speak only of certain lower and upper limits, which will be generally accepted as normal. Just beyond these limits will lie a debatable territory, considered normal by some observers, or for particular individuals, abnormal by others or for other individuals. This is particularly true of the pressures between 145 and 160 M/Hg when found in elderly people, since it will always be difficult to separate the effects of age *per se* from the effects of concomitant pathological changes in the cardio-vascular system. In this paper I shall take 130 M/Hg as the normal standard, because more in harmony with the general physical condition of these men, none of whom were called upon for either bodily or mental activity, rather than the 145 M/Hg which Janeway makes the upper limit of normal systolic pressure. It should be remembered that we have examined different classes of men. It is evident that the age at which these pressures were found had much to do with their clinical significance; in other words, a pressure of 130 in a young man, 20 years of age, if constant, would have far more clinical significance than the same pressure in a man 60 years of age. There seems to be no upper limit of pathological pressure, except the amount which the arteries will stand; I have not found it above 280 M/Hg in this series of cases.

A large proportion of these statistics will be given in connection with blood pressure records, the purpose being to show the relation

or association, *if any*, of arterial sclerosis and hypertension to the intraocular conditions or diseases to which so large a proportion of these men are subject. It will, perhaps, conduce to a clearer understanding of the subject, if I depart for the moment from the statistical plan of the paper and give briefly my conception of the rôle arterial sclerosis and resulting hypertension play in the causation of the ocular diseases so often found in this class of men.

The blood pressure may vary from 50 M/Hg in profound shock to 95 M/Hg, which is about the systolic pressure required to maintain the circulation in health, up to a pressure of 300 M/Hg or even more in disease. These upper limits of blood pressure for self-evident reasons are not so definitely fixed as are the lower pressures, and the power to withstand the high pressure depends on the condition of the arterial walls; these conditions explain the saying that "A man is as old as his arteries," and they also explain why certain families are long lived, attaining to the eighties in good physical and mental condition, while other families age early and are old in the forties, being frequently subjects of death from cerebral and other hemorrhages.

The blood supply of the eye, considering its importance, seems comparatively limited. Only three small arteries, terminal branches of the ophthalmic, enter it. Three of its most important component parts, the cornea, lens and vitreous, have no direct blood supply, but are nourished at second hand, the first two by the anterior and posterior ciliary arteries and the last through the uvea and the retina by its own artery. Obviously any disease which narrows the caliber of these vessels or reduces the elasticity of their walls will affect the circulation of the blood through them and the nutrition of the structures they supply, and degenerative changes result. If we leave the realm of theory and study what we really see in such cases, we find that what is predicated in these statements really takes place in disease. Witness the more than 58 per cent. of cataractous lenses, the per cent. of vitreous opacities, pressure on the veins and chorioidoretinal changes at the disc, which have been observed. We are so accustomed to observing the effects of hyperplastic inflammatory processes that we are prone to overlook the very important classes that are directly degenerative in character, as we see them in the cornea, lens, vitreous, chorioid and retina. I shall not attempt to go into the pathology and etiology of the arteriosclerosis; these are outside the scope of the paper. These and many other statistics show that arteriosclerosis is of frequent occurrence in elderly people. If it is not found, it is because it is

not looked for. These statistics show that of 455 men whose systolic blood pressure has been carefully taken, only 15, or 3.4 per cent., had normal blood pressure, that is under 130 M/Hg, according to the standard used in this paper. (It has been suggested to me that the standard is too low for this class of men, whose average age is 70.76 years, and that a higher normal limit of 145 M/Hg would be nearer correct for them. Having already given the reasons for adopting the lower standard, 130 M/Hg, I may add that 112 men, or 24.5 per cent., gave a reading of 145 M/Hg and under.) The remaining 438, or 75.5 per cent., comprise the debatable pressure (130 to 160 M/Hg), and the distinctly pathological pressure (160 to 280 M/Hg). von Schultin¹ has shown that "the maximum pressure in the ophthalmic artery is only 2 to 15 M/Hg less than that of the aorta itself." Experience has shown that the diffused form of arterial sclerosis, or, as it is sometimes called, angiosclerosis or arterio-capillary fibrosis, attacks by preference the small arteries both superficial and visceral. Its predilection for splanchnic vessels and the terminal arteries in the important organs above the diaphragm and its influence in the production of high blood pressure when so located are well known. This predilection also explains why the condition is so often found in the retinal artery where it is so open to inspection that the clinical picture, tortuous macular arteries, pressure on veins at crossings, ampulliform dilatations, silver wire arteries and hemorrhages, is familiar to all oculists. These conditions were often the first indications of the presence of the disease elsewhere throughout the body before the sphygmomanometer came into use. The value of the information furnished by this instrument in connection with the ophthalmoscope can not be overestimated. It is so important and far reaching in the information it gives that no examination of an individual beyond 50 years of age, so far as diagnosis, and particularly prognosis, are concerned, is complete without one or more blood pressure records. Recent studies along the line of blood pressure and arterial disease seem to indicate that certain ocular complications of several well-known general diseases are manifestations of the arterial disease so often associated with them. This is particularly true of the eye conditions found in those forms of Bright's disease which are now regarded by many pathologists as renal phases of arteriosclerosis, and not as primary diseases of the kidneys. It is of interest to note that Bright himself, as early as 1836, had substantially this modern idea (in a very crude form) of the disease which bears his name.

1. Janeway, *Clinical Study of Blood Pressure*, p. 30.

"The normal strain imposed on the arterial walls by intra-arterial pressure of the blood is of considerable magnitude, amounting to 156 grams for every square centimeter of surface, about $2\frac{1}{4}$ lbs. per square inch."²

All the examinations have been made as follows:

The name, regiment and company; the nationality, age, occupation, drinking habits; specific history has been asked, for in every case, etc.

Nationality has been taken in 494 cases and is shown by statistics as follows: Three hundred and twenty-eight, or 65.6 per cent., were Americans; 59, or 11.8 per cent., were Germans; 85, or 17 per cent., were Irish; 12, or 2.4 per cent., were English; 6, or 1.2 per cent., were not recorded; 1, or two-tenths of 1 per cent., was a Swiss; 1, or two-tenths of 1 per cent., a Swede; 1, or two-tenths of 1 per cent., was an Austrian; 2, or four-tenths of 1 per cent., were French; 4, or eight-tenths of 1 per cent., were Canadians, and 1, or two-tenths of 1 per cent., was a Welshman.

Of the 290 men with cataract in some stage of development, 187, or 64.5 per cent., were Americans; 35, or 12.7 per cent., were Germans; 52, or 18 per cent., were Irish; 2, or seven-tenths of 1 per cent., were French, and of the remaining 14 men I have not figured the nationality.

In fixing the lower limit of age for the examination at 60 years. I have had in mind the limit which would furnish the largest number of cases, and in which so-called senile changes, which constitutes an interesting and perhaps debatable part of the study, begin to manifest themselves with considerable regularity, or at least should be looked for. It seems to me wrong, and at variance with the facts, to call certain degenerative changes in the eye structures *senile*, if by that we mean that they are normal or physiological results of age. This is particularly true of fluidity of the vitreous, incipient nuclear and cortical opacities of the lens and chorioido-retinal disturbances around the disc so often seen in elderly persons. The essential element in these latter cases is atrophy of structure and disturbance of the pigment layer. Exactly the same appearance is seen in well-recognized types of chorioiditis and chorioido-retinitis. Undoubtedly the first is as distinctly pathological as the last condition. While it is natural for all persons to age or become senile, using the word in its generally accepted meaning, the writer believes that the connective tissue proliferation which preceded or brings about these senile changes is distinctly pathological.

2. Nichols: Washington Medical Annals, July, 1906.

Of the first 100 men, the average age is 61.73 years; of the second 100, 79.72; of the third 100, 69.09; of the fourth 100, 68.56, and the fifth 100, 68.70. The average age of the 500 men is 70.76 years. Of 447 men whose blood pressure in relation to age I have figures, only 15, or 3.4 per cent., had pressure under 130; 160, or 33.6 per cent., had pressure under 160 M/Hg, and 281 men, or 60 per cent., had a pressure of 160 to 280 M/Hg. Nineteen men 60 years of age had an average pressure of 166.6 M/Hg; 34 men 64 years of age had an average of 158.2; 20 men 68 years of age had an average of 170.3; 17 men 72 years of age had an average of 171.5; 10 men 76 years of age had an average of 170; 7 men 80 years of age had an average of 180. The average for the whole number was 163.6. I have purposely taken the average in each fourth year for the sake of brevity. Above 80 years of age the number in each year is so small that the averages would be high or misleading. For example, 4 men at 82 years of age gave an average of 187; 2 men at 84 gave an average of only 165; 2 men at 90 gave an average of 205, and 1 man who claimed to be 101 years old had a pressure of 200. The highest pressure recorded, 280, was observed in an Irishman, 75 years old, who had been a hard laborer, a regular drinker, had a specific history and marked hypertrophy of the heart. In the first 100 cases, the 10 highest systolic pressures averaged 207.2, and the second 100, 204; in the third 100, 212; in the fourth 100, 223, and in the fifth 100, 199. Average for the 50 highest systolic pressure, 206.6; average for the 50 lowest diastolic pressure, 77.

OCCUPATIONS.

These represent about 50 different kinds of employment, too many for a statistical table. I have grouped them under two classes. In the first class of 371 men who had followed hard and laborious callings, of which the farmer and day laborer are a type, only 123, or 33.15 per cent., had blood pressure less than 160 M/Hg, while 248, or 66.85 per cent., had pressure from 160 to 280. In the second class, of 142 who stated that they had followed professions, occupations and trades, of which the physician, clerk and bookkeeper may be taken as a type, 65, or 45.8 per cent., had blood pressure of less than 160, and 77, or 54.2 per cent., had pressure above 160. In the first class, 66.85 per cent. had pressure above 160, while in the second class 55 per cent. had pressure above 160. It is believed that the classification referred to above is a satisfactory one and that it demonstrates that the kind of a life a man has lived during his productive working years has more influence in determining what his

physical condition and that of his arteries will be at 60 years of age, for example, than the number of years he has lived. Vital statistics confirm these statements. It is of record that the married man, by a better regulated life, has an expectancy of 60 years, while an unmarried man, for the opposite reason, has an expectancy of only 45 years.

Drinking habits have been inquired into in every case and are represented statistically as follows:

Of 500 men, 89, or 17.8 per cent. claimed to be temperate; 86, or 17.2 per cent., stated that they were regular drinkers; 45, or 9 per cent., stated that they drank periodically, while 240, or 48 per cent., claimed to be moderate drinkers, and in 40, or 8 per cent., no record was made. Of 86 men who acknowledged being regular drinkers, 55, or 64 per cent., had a blood pressure of 160 or over; of 226 men who claimed to be moderate drinkers, 151, or 66.8 per cent., had a blood pressure of 160 and over; of 44 men who claimed to be periodical drinkers, 23, or 52 per cent., had a blood pressure of 160 and over; of 92 men who claimed to be temperate, 57, or 62 per cent., had a blood pressure of 160 and over. These and other statistics show that the influence of alcoholic drinks in the causation of arterial disease has probably been overestimated, and that as an etiological factor it does not compare with tobacco when used to excess.³

SPECIFIC HISTORY.

Admitted by 34 men, or 8.2 per cent., denied by 420, or 48.42 per cent. No record obtained in 36, or 7.8 per cent. Of the 34 men who gave a specific history, none showed blood pressure of less than 130, which, I repeat, is the upper limit of normal pressure according to the standard used in these statistics. Eight, or 23.5 per cent., showed a pressure under 160, averaging 143, and 26, or 76.4 per cent, showed pressure above 160, averaging 185 for the whole number.

It will be observed that these 26 men gave a higher average of blood pressure than any class presented, the six highest giving an average pressure of 237.5. These statistics are reliable as far as they go, because the men themselves have admitted the infection and the sphygmomanometer has confirmed our understanding of the high blood pressure to be expected in such cases, but the motive for denying infection is too strong for the average man to resist; hence the number of non-syphilitics is too large. Diseases due to vicious habits are not pensionable. The average

3. Janeway: Clinical Study of Blood Pressure, p. 119.

soldier understands this and fears that by admitting a specific infection he may in some way jeopardize the pension he is receiving. Here is the chief motive for denying infection.

The following statistics showing the relationship of age, blood pressure and lens opacity is one of the most, if not the most, important set of the series.

Of 910 eyes conforming to the requirements of the examination, 529, or 58.1 per cent., had some kind or degree of lens opacity. Of 25 of these, I have no blood pressure record, so that the ratios are on a basis of 504 eyes, *not men*. Only 16, or 3.2 per cent., had a blood pressure of less than 130, the average was 118.2. The average age of the 16 was 67.3 years. One hundred and fifty-three, or 30.3 per cent., had a blood pressure between 130 and 160, the average was 138.9. The average age of the 153 was 68.2 years. Three hundred and thirty-two, or 66.5 per cent., practically two-thirds, had blood pressure ranging from 160 to 280, the average of which was 179.7. The average age of these 332 was 76.1 years. Fifty, or 9.9 per cent., of the 504 were classed as mature cataracts; 102, or 20.2 per cent., as incipient cortico nuclear; 255, or 50.6 per cent., as incipient cortical; 84, or 16.7 per cent., as incipient nuclear; 7, or 1.4 per cent., as postpolar; 4, or eight-tenths of 1 per cent., as capsular, and 2, or four-tenths of 1 per cent., as traumatic.

INCIPIENT CORTICAL CATARACT.

The 255 eyes with incipient cortical cataract had an average age of 69.4 years, ranging from 60 to 95. The blood pressure ranged from 110 to 250, averaging 163.8; 15, or 5.9 per cent., had blood pressure below 130, the average being 117.7. The ages varied from 62 to 74, the average being 67.5. Eighty-one, or 31.8 per cent., had blood pressure between 130 and 160, which averaged 137. The average age was 67.8; the youngest being 61 and the oldest 85. There were 159, or 62.3 per cent., with blood pressure of 160 or over, the average being 177.5. Their ages, from 60 to 95, averaged 67.8 years. Eighty-five, between 60 and 65 years old, with an average age of 64.3, had an average blood pressure of 160.4, ranging from 110 to 250. Eighty between 65 and 70, with an average age of 68.4, had an average blood pressure of 163.5, ranging from 125 to 230. Thirty-eight between the ages of 70 and 75, with an average age of 73.2, had blood pressure ranging from 130 to 220, with an average of 181.8. Twenty-one between 75 and 80, with an average of 181.78, had blood pressure from 130 to 210, which averaged 174.5. Thirteen between 80 and 85 years, with an average of 83.5, had blood pressure ranging from 150 to 175, which averaged 162.3.

Two at 86 years of age had blood pressure of 190. Six between 90 and 95, with an average age of 94.3 years, had blood pressure ranging from 160 to 180, which averaged 168.3.

In every one of this class the opacity showed first in the lower half of the periphery, with a marked tendency toward the inner quadrant. Mittendorf⁴ has suggested that accommodation and convergence have much to do with the uniformity with which this occurs, but it seems more reasonable from what we know of the pathology of incipient cortical cataract to think that gravity of the fluid portion of the degenerating lens structure offers a better explanation of its uniform location in this part of the lens.

INCIPIENT NUCLEAR CATARACT.

Of the 84 eyes with incipient nuclear cataract, the average age was 72 years, the ages ranging between 61 and 90. The blood pressure was between 130, the lowest, and 250, the highest, averaging 169.7. Twenty-two, or 26.2 per cent., had blood pressure between 130 and 160, averaging 139. The ages of these were between 61 and 78 and averaged 68.8 years. Sixty-two, or 73.8 per cent., had blood pressure of 160 and over, which averaged 192.9. The ages of these, between 64 and 90, averaged 77.9 years. There was none with blood pressure below 130. There were ten below 65 years of age, with an average age of 63, and average blood pressure of 164. Thirty-four between 65 and 70 averaged in age 64.8 years and had blood pressure which averaged 171.2. Fifteen between 70 and 75 averaged 73.3 years and blood pressure of 163. Eighteen between 75 and 80 averaged 77.9 years, with blood pressure of 169.2. One, aged 85, had blood pressure of 170. Six between 85 and 90 averaged 89 years and had blood pressure which averaged 190.

A condition that has been observed with considerable regularity when the cortex has been free from spokes and striæ has been a more or less marked definition of the nucleus, which has varied from a thin nebulous opacity to an apparently dense opacity which, when looked at obliquely and silhouetted against the red background of the fundus, has presented a striking picture of apparent cataract. This increase in the index of refraction of the different layers of the lens is well understood and is consistent with normal vision; it only deserves to be emphasized in order that it may not be mistaken for the more marked condition of incipient nuclear cataract. The condition described by Halben⁵ under the title "Apparent Cataract." has not been observed.

4. Transactions of the American Ophthalmological Society.

5. von Graefe's Archiv. für Ophthalmologie, vol. lxii.

INCIPIENT CORTICO NUCLEAR CATARACT.

In 192 eyes with incipient cortico nuclear cataract had an average age of 71.9 years, ranging from 60 to 95. They had a blood pressure ranging from 160 to 280, with an average of 168.5. Of these, 30, or 29.4 per cent., had a blood pressure between 130 and 160, with an average of 142.2. Their ages ranged between 62 and 85, averaged 70.9 years; 72, or 70.6 per cent., had blood pressure between 160 and 280, which averaged 179.8. The ages of these, between 60 and 87, averaged 77 years. Thirty-two, or 32 per cent., had an average age of 63.5 and blood pressure ranging from 160 to 200, with an average of 167.2. Twenty-one between 65 and 70 had an average age of 68, and blood pressure ranging from 150 to 210, which averaged 170. Sixteen with ages varying from 70 to 75 had an average age of 72.7, and blood pressure, ranging from 135 to 280, averaged 170. Fourteen between ages of 75 and 80 averaged 78.4. The average blood pressure was 166, the lowest being 135 and the highest 200. Fifteen between the ages of 80 and 85, with an average of 83, had blood pressure ranging from 145 to 200, averaging 172.3. Two with blood pressure of 170 were 87 years of age, and 2 at 95 years of age had a blood pressure of 200.

POSTPOLAR CATARACT.

Of 7 eyes with postpolar cataract, the average age was 68.1 years and the blood pressure was 161.4, ranging from 140 to 180. Four below 160 had blood pressure averaging 150, and their ages ranged between 60 and 70, averaged 65.8 years. Three with blood pressure 160 and over, averaged 176.7, while their ages, 68 and 75, averaged 72.7 years.

TRAUMATIC CATARACT.

The two traumatic cataracts were aged 65 and 71 years, respectively, and had blood pressure of 165 to 185.

CAPSULAR CATARACT.

The four capsular cataracts were aged between 65 and 79 and averaged 70.3 years. Their blood pressure ranged from 125 to 180 and averaged 154. One had blood pressure of 125 at 65 years of age. One had blood pressure of 140 at 70 years. Two had blood pressure of 170 and 180 at ages of 67 and 79 years, respectively.

Of 25 cataracts there is no record of blood pressure; their average age was 74. They were classified as follows: 14, incipient cortical; 5, incipient cortico-nuclear; 4, incipient nuclear; 1, mature, and 1, post-polar.

MATURE CATARACT.

Of 50 cases the average age was 68.5 years, ranging between 60 and 85. The blood pressure was 161.3, ranging between 130 and 210. Fifteen, or 30 per cent., of these had a blood pressure between 130 and 160, averaging 139.3. The average age of these 15 was 66.4 years. Thirty-five, or 70 per cent., had a blood pressure between 160 and 210, averaging 170.7. Their ages averaged 69 years. Twenty of these 50 were between 60 and 65 years of age, with an average of 63.1 years. Their blood pressure ranged from 130 to 200 and averaged 160. Fifteen were between 65 and 70, with an average of 68 years, and blood pressure from 130 to 185, averaging 162.3. Nine were between 70 and 75, having an average of 72.2 years, their blood pressure ranging between 145 and 200, averaging 169.5. Three with an average age of 77, between 75 and 80, had a blood pressure of 178.3, and three at 85 had blood pressure of 190. None of these had a blood pressure below 130.

Four hundred and forty-one men, or 82.2 per cent., showed some degree of chorioido-retinal disturbance around the disc; 140, or 31.7 per cent., had blood pressure below 160 and 301, or 68.3 per cent., had pressure above 160. Of 283, or 64 per cent., in whom the condition was noted, 249, or 56.5 per cent., had the atrophic and 34, or 6.8 per cent., the pigmented crescent of chorioidal disturbance; 46, or 9.2 per cent., had chorioidal rings; 43, or 8.6 per cent., had the atrophic and 3, or six-tenths of 1 per cent., had the pigmented ring of chorioidal disturbance; both crescents and rings have been limited to 3 millimeters or less in diameter; larger areas have usually been associated with the disseminated form of chorioiditis and are grouped under it.

Tortuous retinal arteries were observed in 25 cases, 5 per cent.; none of these had blood pressure of less than 130, and there were 5 between 130 and 160 and 20 with pressure of 160 and upward. Of these, two had 170, three had 180, four had 190, and five had 200 M/Hg pressure.

Forty-one cases, or 8.2 per cent., showed some degree of compression of the retinal veins where the hard arteries crossed them. These degrees of compression varied from slight indentation to well-marked ampulliform dilatation and hemorrhages. None of these had a blood pressure under 130; 6 showed from 130 to 160, and 35 ranged from 160 to 280. Of these, two had 160, four had 170, five had 180, four had 190, eight had 200, and two had 230 M/Hg pressure.

Papillitis and hemorrhages were observed five times, or 1 per cent., and four of these had a blood pressure above 160 as follows: one at 160, one at 185, and two at 200.

White lines along the blood vessels (perivasculitis) were observed six times, once with pressure of 150 and once, each, with 160, 170, 180, 185, 210. No well-marked cases of silver wire arteries has been observed, and two cases of cilio-retinal arteries have been seen.

Of 500 men with 910 eyes, the following records of refraction were obtained:

Fifty-four, or 5.5 per cent., were emmetropic; 507, or 55.7 per cent., to which can be added 21, or 2.3 per cent. of vision after cataract extraction, making a total of 528, or 58 per cent., hypermetropia; 30, or 3.3 per cent., had hypermetropia and hypermetropic astigmatism; 10, or nine-tenths of 1 per cent., had simple hypermetropic astigmatia.

Forty, or 4 per cent., were myopic. Three, or four-tenths of 1 per cent., had myopia and myopic astigmatia. Two, or two-tenths of 1 per cent., had simple myopic astigmatia, and in 33, or 33.2 per cent., vision was not improved with glasses.

Three hundred and eighty, or 77.4 per cent., stated that they had never worn glasses constantly. Forty-one, or 9.1 per cent., had worn glasses constantly, and of 72, or 14.4 per cent., I have no record. Of 274 men with some kind or degree of lens opacity or vision after cataract operation in relation to refractive conditions and their correction by glasses, 162, or 65.6 per cent., were hypermetropes; 116 of these had never worn glasses constantly; 19 had worn them constantly, and of 27 there is no record. Twenty-one, or 7.7 per cent., were myopic. Of these, five had worn glasses constantly, 13 had never done so, and of three there is no record. In 83, or 30.3 per cent., vision was not improved by glasses; 71 of these had never worn them constantly, one had done so, and of 11 there is no record, and 8 with emmetropic eyes showed incipient cortical opacity in the extreme periphery of the lens.

COLOR OF IRIDES.

In this classification no variation in shades of color are considered; all shades of blue are classed in blue, the same with gray, brown, hazel and black. Fifteen men, or 3 per cent., had black eyes; 173, or 34.6 per cent., had blue eyes; 150, or 30.1 per cent., had gray eyes; 96, or 19.2 per cent., had hazel eyes, and 66, or 13 per cent., had brown eyes.

The average pupillary distance of the 500 men, measured with a small millimeter rule, was found to be 6.2 centimeters, about $2\frac{7}{16}$ inches. The transverse diameter of the cornea, usually of the left eye, had been measured with the same millimeter rule. The average diameter had been 12 millimeters. This perhaps is slightly larger than the average. It should be remembered, however, that the soldiers of the civil war were, as a rule, larger men than the average in civil life in that day, for the reason that the standard of admission to the army eliminated undersized men. The average size of the pupil has been 3.3 millimeters. As a rule, between 60 and 70 years of age the degree of dilatation from 2 to 3 drops of a 1 per cent. solution of homatropin in each eye has been sufficient for the purpose, and has about equaled twice the size of the pupil normal for the individual, on an average. For example, if the pupil was 3.5 mm. in diameter, the degree of dilatation has been about equal to 7 mm. After 70, the pinhead pupil so commonly seen will not dilate to double its natural size, a 2 mm. pupil will average 4, a 3 mm. pupil will average 5 and occasionally 6 mm. There has also been observed a close relation between the diameter of the cornea, the size of the pupil and the degree of dilatation to be expected. No case of glaucoma has developed from the use of the mydriatic in these 910 eyes.

My thanks are due Major F. W. Roush, Surgeon of the Home, for permission to conduct this inquiry. His sympathy and cooperation in the work is respectfully acknowledged.

For the aid and assistance given in the preparation of these statistical tables, Dr. J. W. Millette, my assistant in St. Elizabeth Hospital, has my sincere thanks.

As has already been stated, most of these blood pressure records have been made by Dr. H. A. Slusser. I can vouch for the substantial correctness of his readings, and it is a source of great pleasure to testify to his zeal and untiring interest in the prosecution of the study.

I am under many obligations to Dr. T. C. Janeway, of New York, for his kindness in looking over the manuscript and for two important corrections in the subject matter which have made it clearer and more comprehensive in relation to blood pressure. But it is not intended to imply that he assumes any responsibility for any of the statistics or the statements made, by having done so.

Dr. W. J. Conklin, of this city, has given me much valuable aid, for which my thanks are due.

ANGIOSCLEROSIS OF THE EYE.*

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The effort to find a subject of interest and of vital moment to one's collaborators is not easy, and I have selected arteriosclerosis or angiosclerosis and its effects on the structure of the eye, in the hope of bringing to you something for consideration that has been of much interest to me and benefit to my patients, and may perhaps be not without profit to us all.

It will not be amiss to review in brief the composition of the normal structures that we are considering, after naming the causes that lead to the pathologic condition; we may the better appreciate the changes that take place and their relative effects and understand why certain symptoms occur, subjective and objective.

The causes of angiosclerosis may be summed up as follows: Congenital anomalies, syphilis, faulty metabolism, toxic agents, including alcohol, tobacco, and the toxins of the organisms of acute infectious diseases.

To be brief, the eye is formed chiefly from the invaginated ectoderm and the enclosed mesoderm that attains its position through the chorioidal fissure and becomes so important a factor in maintaining ocular nourishment during the entire existence of the eye. From the mesoderm are formed those parts with which we will concern ourselves, and in them we find vascular tissue, namely, the vessels of the nerve fiber layer of the retina; the chorioid, iris and sclerotic are the most extensive outgrowths of the mesoderm.

We will consider these parts in the order named. The nerve fiber layer of the retina contains all the larger vessels of the retina. The arteries have an intima lined with endothelium, muscle fibers and an adventitia rich in elastic fibers, the outer of which run longitudinally.

As the vessels diminish in size, the media is the first tunic to disappear. The veins, lined also with endothelium, have almost no media, but are very rich in elastic fibers. The capillaries are mere endothelial tubes. There are no lymph vessels, but there are lymph spaces around the blood vessels, the so-called perivascular lymph

* Read at the Twelfth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, held at Louisville, Ky., Sept. 26-28, 1907.

spaces. It would be well here to state that these blood vessels lie within the nerve fiber layer, between the internal limiting membrane and the ganglion cell layer, in contact with the non-medullated axis cylinder processes of the ganglion cells, and this proximity has much to do with the pathology of these structures.

Normally the chorioid is composed of the membrane of Bruch, a homogeneous structure lying between the retina and the choriocapillaris and joined to this layer by some elastic tissue. The choriocapillaris is a network of fine meshed capillaries, becoming coarser or more open toward the ora serrata. The layer of medium-sized vessels contains much fine elastic tissue with a few pigment cells and endothelium separating it from the choriocapillaris on the inside and the larger vessels on the outside. Its veins are without muscular tissue, and their endothelial lining is separated from the adventitia by the perivascular lymph spaces of the choriocapillaris.

The arteries are composed of an endothelium, a media with circular muscle fibers and an adventitia with longitudinal muscle fibers, together with perivascular lymph spaces. The layer of large vessels, chiefly veins, is imbedded in membrane of pigmented elastic fibers.

The suprachorioid is a pigmented elastic-fiber membrane, with endothelium between it and the lamina fusca of the sclerotic, assisting in the formation of the suprachorioid lymph space and communicating with the capsule of Tenon.

The sclerotic is pigmented and is united to the chorioid by pigmented connective tissue, lined with endothelium to form the part of the suprachorioid space. This endothelium invaginates all the muscles, nerves and vessels crossing this space. The sclerotic is composed of white and elastic fibers, distributed in bundles, running longitudinally, circularly and diagonally, one or another arrangement preponderating in the different parts of the globe, depending for direction on the necessary function. It contains a few vessels and contains the origin of the posterior ciliary veins and, in part, the anterior. Its arteries are derived from the shorter posterior and long or anterior, and the ciliary branches of the posterior, forming the anastomotic ring around the optic nerve by uniting with the branches of the central retinal veins.

The early pathologic changes in the vessels are, of course, similar in all tissues, differing only in so far as surrounding tissues permit. With the slightest disorganization of the vessel wall there is a transudation from the vessel into the contiguous tissue. In the retina this causes an edema that may be limited to the nerve fiber

layer, and is readily remedied, but, on the other hand, may affect the outer nuclear layer, in which case complete recovery cannot take place. If the inflammation progresses beyond the edematous stage an exudation of plasma and polynuclear leucocytes occurs into the adventitia and perivascular space, and we have the beginning silver wire vessels. In the smaller vessels the endothelium proliferates and there is increased connective tissue formation.

These changes usually occur first in the retina, where the vessels are smaller; next the inflammatory process appears, in the choriocapillaris; next in the medium-sized vessel layer; next in Haller's layer, and later still degenerative and proliferative changes are found in the sclera.

The symptoms noticeable to the patient are muscle tire, with headache attendant on the use of the muscles; scintillation scotoma; slight or prolonged blindness, or blurring vision, and this is sometimes the only symptom from which the patient feels discomfort, and is the reason that many persons are seen in the early stages who are seeking relief from this single disturbing feature. The objective symptoms are a conjunctivitis, a partial ptosis, nystagmus, blepharospasm, possibly a marked pulsation of the temporal arteries and carotids, and, with a sphygmomanometer, an high arterial tension (which, though usual, is not always present). With the ophthalmoscope a hazy disc and retina, possibly obscuration of the capillary vessels and apparently nodes or interruptions in them as they cross the disc or approach the macular region, with a tortuosity; white lines or bands of the larger vessels; arterial pulsation, and perhaps spasm; aneurismal dilatation; perhaps hemorrhage into the retina and chorioid, or the chorioid vessels may show white streaks or bands; chorio-retinitis or neuro-retinitis; or any of the ophthalmoscopic signs of degeneration or proliferative changes. The fields are liable to be contracted in proportion to the amount of destruction present.

The diagnosis is easy or not, according as one by experience is familiar or not with slight changes in the color and shape of the retinal vessels; I say slight because, of course, the gross lesions are very plain, but the disease has progressed at this stage so far that it is less amenable to treatment.

The earliest ophthalmoscopic signs are the slight haze and indefiniteness of the disc and surrounding retina, with possibly obscuration of the capillary vessels, apparent nodes or interruptions in them; together with a tortuosity of the capillaries about the macula or at the periphery; and later, when the round cells enter the ad-

ventitia and perivascular lymph spaces, the beginning white lines along the vessels that later become broader and the vessels appear as white bands. As the vessels become disintegrated and connective tissue forms the depression of indentation of the vein where the artery crosses the vein, and the apparent "hump" of the veins over the artery where the vein crosses the artery; at this time nodes appear on the larger vessels of the retina.

There may be arterial pulsation and aneurismal dilations may occur. Veins passing through similar degenerative changes are more unsymmetrically filled and tortuous, later becoming engorged, and even obstructed, by the pressure of a crossing artery.

Together with these ophthalmoscopic signs the subjective symptoms will vary from a temporary scintillation scotoma, temporary blindness as from arterial spasm, to headache, asthenopia and progressively, so-called "failing vision," or "weak vision." The corroborative evidence of high blood pressure, together with the concomitant organic lesions in the liver, kidneys and heart, is of great value, but, as has been pointed out by many observers, among them Mr. Gunn, the lesions may occur in the vascular structures of the eye long before they appear elsewhere in the body, so that lack of the above evidence must not mislead.

It may be well here to recall the probable changes in the cerebral vessels similar to those in the retina, and therefore of prognostic value, that the knowledge of the condition of the retinal vessels gives.

The future of the eye that is diseased dependent on angiosclerosis is bright or dark according to the period at which the lesions are discovered. Nothing is more encouraging to the practitioner in ophthalmology than the results obtained from treating conditions discovered at an early date, when the loss of visual acuity is only temporary, amounting sometimes to 90 per cent. and often to more than 50 per cent.; on the other hand, there is no condition more intractable than a disease of the eye due to long standing changes in the vascular structures. To make a well considered prognosis is always a good rule to follow, and especially is it so in these conditions, for experience shows that without the helpful co-operation of the patient in faithfully carrying out the instructions of the physician there can only be recurrences and ultimate failures from any kind of treatment.

The treatment consists in correcting any disturbance of digestion by diet, lavage, cathartics; regulating the blood pressure; by restricting the fluid intake and reducing the quantity of salt ingested

(to prevent retention of excess of fluid); by the administration of nitrites and iodids (sodium preferred, because it does not irritate the gastric mucous membrane and because of its affinity for the connective tissue structure of the blood vessels); by the use of pilocarpin; by baths and packs; and the use of strychnia or tincture of nux vomica. Locally the use of hot moist applications of salt or boric acid and of subconjunctival injections and in some cases dionin.

The sequel of angiosclerosis of the vessels of the eye may be any disease that can possibly result from degeneration of the vessels; from a simple retinitis or chorioretinitis, or retinitis circinata to retinitis pigmentosa or hemorrhagica; to cataract; glaucoma with or without hemorrhage; to embolism of the central or branch arteries or to thrombosis of a branch or central vein.

In conclusion I wish to thank the committee for its kindness in giving me an opportunity to present some views regarding conditions of the structures that carry nutrition to the eye, and which in my experience have caused much ocular disease, that is easily and promptly curable in the early stages, but in later stages requires all the thought, patient care and attention that an earnest worker is able to give, to obtain any satisfactory results from treatment.

Abstracts from Recent Ophthalmic Literature.

ANATOMY.

ELASTIC TISSUE IN CONNECTION WITH THE GLAND OF MOLL.—CARLINI, V., Livorno (*Ann. Di Ottalmologia*, Nos. 3 and 4, 1907.) In 1887 Sattler gave a full description of the gland of Moll. He described gland cells, fibro-cellular muscle, an endothelial layer and a fine elastic network surrounding the gland tubes. Three years later Tartuferi gave a description of the gland tubes very different from that of Sattler. This difference concerned especially the fusiform cells which German ophthalmologists interpreted as fibro-cellular muscle. The writer examined some sections stained with orcein as modified by Livini. The tissue presented always under the form of fibers, some large, others small, with all gradations in size. These fibers in their entirety did not assume any typical disposition. They were distributed irregularly in every direction, making up a sort of filter which became more dense as they approached the membrana propria of the gland tube. The secreting tube of the gland, while uniform in the first period of life, changes and in successive years becomes deformed and dilated. The quantity and disposition of the elastic elements which surround the gland tube have nothing to do with the dimensions which this assumes. The connective tissue which surrounds the tube is rich in elastic elements which form a dense filter at the membrana propria.

R. H. J.

ON THE MUSCULUS DILATOR PUPILLÆ.—ALT, ADOLF, St. Louis. (*The Amer. Jour. of Ophthalmology*, September, 1907.) The writer calls attention to the fact that a number of the more recent text-books speak of the dilator muscle of the pupil as an undoubted and definitely proven entity and give nice and simple illustrations, but that such drawings and descriptions are probably not representing the true relations. He considers some of the more recent papers on this subject. He quotes from Kiribuchi that "according to Henle, Merkel, Luschka, Jeropheeff and others, this limiting membrane consists of unstriped muscular fibers, while their antagonists, Gruenhagen, Hampeln, Schwalbe, Michel, Koganei, Fuchs and others describe it as a structureless vitreous membrane with elastic properties, or as a tissue midway between elastic and connective tissue."

The writer reviews the writings of A. Szili, Jr., Levisohn and Muench and then describes his own studies on this subject, concluding with the statement: "Granted then that what we have seen and described is the *musculus dilator pupillæ*, it appears that it is rather a weak muscle in comparison to the *sphincter pupillæ*. It seems, therefore, very probable that its action is enhanced by the contraction of the iris arteries and, perhaps, by the relaxation of the sphincter muscles whenever a dilatation of the pupil takes place."

C. H. M.

AMBLYOPIA AND BLINDNESS.

AMBLYOPIA FROM ECLIPSE OF THE SUN.—CASALI, A., Florence. (*Ann. Di Ottalmologia*, Nos. 3 and 4, 1907.) Case 1.—A boy, 17 years old, looked at an eclipse of the sun ten times, five or six seconds each time. He suddenly observed that vision was clouded and he could not read well. Then appeared before his eyes a ball as of smoke, in which there seemed to be a large number of gnats which obscured his vision. He could not distinguish faces at thirty meters, though he could see fairly well the other parts of the body, which seemed cloudy. Slight photophobia and nyctalopia were present. Both eyes showed relative scotomata for white and colors. In O. S. the ophthalmoscope revealed slight venous engorgement, slight redness of the papilla, transparent retina. In the macular region there was a round area of the size of one-half papilla of a red color. The limits of this zone vanished gradually into another oval zone of a clear red color, which was in turn surrounded by a zone of clear gray color. In the middle of the red zone could be distinguished a small, white, glittering point, round, with a little more brilliant reflex than the normal fovea. Treatment was injections of strychnin into the temples and the galvanic current with the positive pole to the eye and the negative to the back of the neck. After sixty injections and eighty electrical treatments he recovered entirely. Case 2.—A boy, 15 years old, looked at an eclipse with the naked eye five or six times, longer with O. S. Cloudiness of vision soon came on. Slight photophobia and nyctalopia were present. In O. D. there was a central relative scotoma for white and colors; in O. S. a central absolute scotoma for white and colors. The ophthalmoscope showed slight hyperemia of the papilla, veins somewhat turgid, retina gray around papilla and macular region. All these signs were pronounced in O. S. In O. S. in the macular region there was a round zone of a red color of the size of one-half the papilla with a small white point in the center, surrounded by an oval zone of red-gray color. In

O. D. the round zone was smaller in the macular region and of normal red color. The reflex of the fovea was less brilliant than in O. S. and of semilunar form. The treatment was the same as in Case 1. After sixty treatments the scotoma was stationary, absolute for white and colors. The author distinguishes three classes of cases: 1. Serious, in which there is an absolute central scotoma which is permanent relatively for white, absolute for colors. Vision does not return to normal. 2. Moderate severity, in which a relative scotoma is present and the examination of the fundus shows a somber, red color in the macular region. *Restitutio ad integrum* takes place in three to ten months. 3. Mild, in which there is a central relative scotoma for colors and which reveals no macular changes. Complete recovery is the rule in one to three months.

Conclusions.—Looking at the sun directly or at the image through glass or on water causes changes in the visual function characterized by photophobia, nyctalopia, diminished vision and central positive scotoma. Such a scotoma may be absolute or relative for white and colors or for colors alone. Frequently a slight restriction of the vision F. for white and colors and an accompanying asthenopia are seen. The ophthalmoscope shows constant signs, viz., a somber, red color and a greater extension of the normal center of the macular region, accompanied often by slight congestion of the papilla, retinal edema, venous engorgement; in rare cases there may be a true serous retinitis. Hemorrhage in the macular region is rarely observed.

R. H. J.

MAKING WAGE-EARNERS OF THE BLIND OF CLEVELAND.—(*Cleveland Plain Dealer*, Sept. 22, 1907.) Cleveland, Boston and New York have each an industrial school for the non-residential adult blind. The schools in other cities are under state management and receive only the youthful blind. A census of the blind is being taken by the Associated Charities of Cleveland; the industrial school has been established by the Goodrich House, and about 200 books in raised type have been secured by the Cleveland Public Library. The Society for Promoting the Interests of the Blind has 100 members, each of whom pays an annual fee of \$5.00. About 400 blind are within the limits of Greater Cleveland. Weaving, cane-seating and broom-making are taught, and additional courses will be provided as soon as there is call for instruction in other occupations. A store is conducted by a blind man, where hand-made brooms are readily sold. The woven fabrics resemble the fine texture cloths of olden days and find a ready market. An employment agency at the Goodrich School, modeled after the

Saxon system prevailing in Germany, provides for a constant watch over a pupil until a permanent position is secured and investigates the outlook in any city to which a blind pupil may wish to go. The Visiting Nurse Association has arranged for one student to take a course in massage in a large hospital. A scholarship will be awarded from a competitive examination at Western Reserve University next year. A ticket bureau similar to that in New York for soliciting the use of otherwise unused tickets for concerts, lectures and the theater has been established. M. D. S.

ANOMALIES.

A CASE OF ATYPICAL COLOBOMA OF THE IRIS—ZIMMERMANN, Gorlitz (*Graefe's Arch.*, lxvi, H. 2, July, 1907), saw this anomaly in the right eye of a man 27 years of age. The history pointed to its being congenital. The cornea was small and the lower inner quadrant decidedly shortened. In the lower half, the sclerocorneal juncture was irregular and blended. The sclera was flattened in the lower-inner quadrant. (Three scars like posterior perforating healings were present in the lower inner quadrant of the cornea.) The iris was wanting in the entire lower half except for two pigment remnants which rested upon the membrane of Descemet. The dividing line between the retained and absent iris structure extended from up and out through the center of the horizontal meridian to down and in, forming a slight convex arch upward. The pigment layer was not everted. The iris structure was anomalous as the crypts were absent. The iris appeared uniformly bright red-brown. Under light and convergence stimulus the curved edge of the iris became straight. Under atropin the arch became of a shorter radius. Over the anterior capsule there were diffuse overlying pigment spots. There were no other anomalies. In the left eye the sclero-corneal margin was blended and bluish. The pupil was irregular. Its long axis was upward and inward. The iris was chocolate color. The author does not agree with Boch in attributing the same mode of origin for typical and atypical colobomata, but believes that from the evidences of inflammation present in the latter form a different origin is probable.

W. Z.

THE EYE OF ALBINOS.—LAGLEYZE (*Arch. d'Ophthalmologie*, June, 1907). In complete albinism the skin is thin and translucent and of a white, slightly reddish or yellowish tint like that of wax figures. The hair of the scalp, eyebrows and lashes is generally of the color of flax. The attitude of an albino is due to his dread of

light. The head is bent forward, the eyes are half closed, the constant contraction of the eyebrows causes wrinkles which, added to the white hair, give him an aspect of age. The stature, nutrition, constitution, temperament and intelligence do not differ from the normal. The diminution of intelligence noted by many authors is not proven, but the intellectual indolence sometimes observed in albino children is nearly always due to visual defect. The condition affects the two sexes indifferently.

The eyes resemble those of the white rabbit. The skin of the lids is thin and reddish. The conjunctiva is usually hyperemic, the sclerotic has not the bluish-white color of the normal eye, but is reddish. There are radiating striæ toward the periphery due to the radiating blood vessels. The color varies with the light—red when this is bright and grayish violet when it is dull. The pupil is usually small and dilates but little in feeble light, but reacts regularly. It is frequently displaced inward and upward, the shadow of the frontal bone and of the bridge of the nose causing an unequal contraction of the sphincter. The pupil is of an intense red color, but if a screen with an opening corresponding in size to the normal pupil is placed before the eye it becomes black. In ophthalmoscopic examination the body of the iris, especially toward the periphery, presents points of more intense red, like that of the pupil, which has caused some observers to suppose that the iris of albinos had multiple little openings (polycoria), but microscopical examination shows that this is an error. The chorioidal vessels are easily seen with the ophthalmoscope. They seem flat, like converging ribbons.

The optic disc can often be located only by the origin of the retinal vessels. Cases have been reported in which it had a dark tint.

Nystagmus is rarely absent; it usually develops in early infancy, but may be congenital. It is attributable to the amblyopia and is increased when the subject attempts to fix an object.

Photophobia, of course, exists. It is not exactly the painful photophobia that accompanies certain diseases of the eye, and Buzzi has proposed to call it *holiophobia*, by which name it is usually known.

There is no dark chamber and the retinal images are indistinct. The visual acuity is always diminished, varying from one-sixth to one-tenth of normal. There is a veritable amblyopia which is not diminished by a stenopaic screen because the light is reflected

irregularly in different planes by the chorioidal vessels and the sclerotic.

Chromatic and peripheral vision are not appreciably modified.

The refraction is usually considered to be myopic on account of the thinness of the sclerotic and the excessive convergence and accommodation. The author, however, thinks that albinos are indifferently myopic or hypermetropic, but finds that their refraction is characterized by astigmatism according to the rule, which he attributes to the constant pressure of the lid on the upper segment of the cornea.

The relation between the border of the lens and the movements of the ciliary processes in accommodation can be readily studied in the albino (Becker).

Other teratogenic lesions have frequently been noted as complications or coincidences—such as polycoria, persistent pupillary membrane, congenital cataract, subluxation of the lens, optic atrophy and strabismus, but the author has not met with them.

Incomplete albinism is found in the last stages of depigmentary progression which, without sudden transition, has its point of departure in the blonde.

Complete albinism is absolute and permanent. Cases of incomplete albinism have been reported in which the condition decidedly improved in years, the eyes assuming a grayish blue or even a brown color. The evolution of pigment, which normally continues after birth, was simply delayed.

The etiology of albinism is not determined. The author believes that heredity and consanguinity are the most prominent causes, and adduces facts to prove that it may be the result of consanguinity alone. It has been observed in rabbits that if there is the smallest white spot among consanguineous ancestors it increases progressively in the progeny and albinism rapidly appears.

Some authors still maintain that a mixture of negro blood predisposes to albinism, but it is pretty generally admitted that this is a mistake and that it may appear in any race.

Inherited human albinism may skip one or several generations. In some families all the children are albinos, while in others they alternate irregularly with normal children.

Numerous authors (Buffon, Darwin and others) have observed that albino dogs and cats are deaf, and Blumenbach, Weiss and others considered albinism a disease. The author agrees with those who consider it an arrest of development. He believes that Haab's suggestion to tattoo the cornea except a central space would

give no relief and that the only rational treatment is careful correction of the refraction and the use of tinted glasses G. C. H.

A CONGENITAL ABNORMALITY OF THE CORNEA.—GOLDSMITH, G. H., Bedford (*Ophthalmoscope*, October, 1907). A healthy child of 10 weeks presented a large triangular porcelain-like opacity of one cornea occupying the lower quadrant. This opacity was first observed four days after the child's birth. The opaque area was somewhat elevated above the surrounding cornea. In the course of about six months' time the opacity entirely disappeared, but it was found that the iris was adherent to a small spot at the posterior surface of the cornea corresponding to the region of the former opacity. The diagnosis was that of congenital leucoma adherens. M. B.

BACTERIOLOGY.

THE VALUE OF SYSTEMIC BACTERIOLOGIC AND MICROSCOPIC STUDY IN THE TREATMENT OF GONOCOCCAL CONJUNCTIVITIS.—OLIVER, CHAS. A., Philadelphia. (*Ophthalmoscope*, August, 1907.) Rough smear and most careful stain studies should be made not only for the certain diagnosis of this disease, but also during the daily progress. As a result it has been found that the most virulent types of cases can be governed more easily, the milder forms more speedily bettered and cured, and the clinically insignificant ones quickly gotten rid of. M. B.

CONTRIBUTION TO OUR KNOWLEDGE OF KERATOMYOSIS ASPERGILLINA.—ZADE, Leipzig (*Graefe's Arch.*, lvi, H. 3, May, 1907), records a case of this affection occurring in a woman 44 years of age. There was an oval sharp-cut ulcer with a gray elevated floor. Some distance from it and separated by clear corneal tissue was a crescent of infiltration. There was marked iritis and hypopion. One month later it was found necessary to do a Saemisch operation. Numerous inoculations of glycerin agar and serum were made, and without exception pure cultures of *aspergillus fumigatus* were obtained. With glycerin cover preparations, two showed typical fructifying organs of the a. f. Both of these preparations were obtained from the center of the fungus colony. Preparations from the peripheral parts did not show them. The author devotes considerable attention to the question of the occurrence of fructifying organs of the a. f. in the eyes, and gives as his opinion that the reason that they have so rarely been found is due to the following causes: 1. The conidien carriers occur only in an advanced stage of the fungus development. 2. That they occur only in the super-

ficial part of the central portion of the fungus colony. 3. That the formation of the fruit carriers, aside from these limitations, is hindered by the movements of the lids and the flow of tears. 4. Conidien carriers are found only in fresh unstained preparations.

He adds nothing new to the therapeutics or symptomatology of the affection.

W. Z.

CASUISTICS.

AN INQUIRY INTO THE CAUSES OF BLINDNESS IN 333 INMATES OF THE SHEFFIELD SCHOOL FOR THE BLIND.—SNELL, SIMON. Sheffield (*The British Med. Jour.*, Nov. 2, 1907). Among these 333 instances of blindness the greatest number, 136, or 42 per cent., was caused by ophthalmia neonatorum; 35, or 11 per cent., were due to optic nerve atrophy following meningitis or brain disease; 22, or 7 per cent., to sympathetic ophthalmia; 30, or 9 per cent., to congenital cataract; 12, or 4 per cent., to other congenital conditions; 10, or 3 per cent., to diffuse corneitis; 8, or 2½ per cent., to chorioido-retinitis; 11, or 3½ per cent., to measles; 9, or 3 per cent., to scarlatina; 7, or 2 per cent., to corneal ulceration; and 7, or 2 per cent., to optic nerve atrophy after injury to the head.

C. H. M.

RESULT OF THE EXAMINATION OF THE EYE, EAR, NOSE AND THROAT OF THE CHILDREN IN THE PUBLIC SCHOOLS OF SPRINGFIELD, OHIO.—MINOR, C. L., Springfield (*Ohio State Med. Jour.*, July, 1907), gives the results of the examination of 4,792 children. Total number of children showing defects was 40 per cent. Myopia, 5 2/3; hyperopia, 12 1/3; deafness, 12 6/7; impacted cerumen, 7; purulent otitis, 2/5; tonsils, 12 1/3; adenoids, 5. He calls attention to the small number of purulent otitis cases, 10 in all; that there were only 32 wearing glasses; that there were 216 who were two years or more above the average age, and of this number 95 had some defect of the special organs. The author believes that these examinations should be made by medical men.

W. R. M.

A CLINICAL STUDY OF FIVE HUNDRED CASES OF CONJUNCTIVITIS.—MCKEE, HANFORD, Montreal (*The Amer. Jour. of the Med. Sciences*, November, 1907). By using bacteriological methods we come to divide cases of conjunctivitis, not from their clinical features into catarrhal, purulent and membranous with their numerous subdivisions, but rather into two groups: (1) Conjunctivitis with no known bacteriological cause, and (2) conjunctivitis in which there is a definite bacteriological factor.

The writer gives a brief summary of the frequency of the different forms of conjunctivitis founded on the reports of various observers. His own report is based upon 500 cases, of which 200 were of the Morax-Axenfeld type. The total of these figures (2,938) consists of a plurality of Morax-Axenfeld conjunctivitis (116), the next most common forms being the Koch-Weeks, the pneumococcic and the gonococcic.

In Montreal by far the most common is the Morax-Axenfeld, seen in one of four forms: (1) A mild catarrhal conjunctivitis with little or no involvement of the bulbar conjunctiva. (2) A catarrhal conjunctivitis with reddening at the outer and inner canthi. (3) A severe catarrhal conjunctivitis with marked involvement of the bulbar and palpebral conjunctiva and marked blepharitis. (4) An acute purulent conjunctivitis. The writer has found a great many acute cases.

The Morax-Axenfeld conjunctivitis existing in Montreal differs in many ways from the descriptions in literature: Many had severe subjective symptoms with pain, worse at night; many were acute, simulating blennorrhea; some cases were complicated with corneal ulceration; a series of cases complicated by phlyctenular conjunctivitis was seen. Zinc sulphate never failed to cure even when corneal ulceration existed, and the cases associated with trachoma reacted well to this treatment. Silver nitrate and argyrol were unsatisfactory.

The writer then describes a form of conjunctivitis which he believes has not yet been described, and which he calls "McKee conjunctivitis," giving a clinical picture as follows: Both eyes involved, profuse mucopurulent discharge, palpebral conjunctiva intensely congested, bulbar conjunctiva normal, lids neither red nor swollen. This new form of conjunctivitis was observed in nine infants, all showing definite clinical features and from each case a bacillus was isolated which had the following characteristics: It was Gram negative, too short and thick for the Koch-Weeks bacillus and too thick for the *Bacillus influenzae*. It grows best upon hemoglobin agar. It is pathogenic for the human conjunctiva, producing the characteristic form of conjunctivitis when the sac is inoculated with a pure culture, and the discharge, in its turn, showing the organism. The writer discusses this form of conjunctivitis and its special organism further under the heads: Clinical considerations, morphology, cultural features and pathogenicity.

C. H. M.

FOUR YEARS' WORK WITH THE OPHTHALMIC HOSPITALS IN EGYPT.—MACCALLAN, A. F., Egypt (*Ophthalmoscope*, September, 1907), who is the ophthalmic surgeon of the Traveling Ophthalmic Hospital of Egypt, which was endowed by Sir Ernest Cassel, reports upon the work accomplished in four years. The good accomplished has served to incite the Egyptian government to undertake the provision of permanent ophthalmic hospitals in every large provincial town. These hospitals will be under the control of the author. Two such hospitals are now under construction and others will be built yearly as finances permit. His staff consists of himself, two English and four Egyptian surgeons and a large clerical and hospital staff. During the year 1906, 40,103 patients were examined at the hospitals, and, of these, 7,327 were admitted for treatment either as in-patients or as out-patients. Five thousand eight hundred and forty-six operations were performed. M. B.

CATARACT.

CONTRIBUTION TO THE PATHOLOGIC ANATOMY OF CONGENITAL TOTAL CATARACT.—MAGNUS, GEORG. (From the eye clinic of Prof. O. Schirmer in the University of Greifswald. *Klinische Monatsblätter für Augenheilkunde*, xlv, July, 1907, p. 51.) The investigations of Schirmer, Hess, von Hippel, Stock and others have shown that the four kinds of congenital opacities of the lens—zonular, central, fusiform and total cataracts—are related to each other. Common to all is a nucleus filled with vacuoles and drops and, between this and the capsule, lens tissue which shows all stages of detritus and liquefaction. Hess considers congenital total cataract as a far advanced zonular cataract.

Magnus adopts this explanation for his case of bilateral total cataracts in a boy, 5 months old, which were successfully extracted without iridectomy by Professor Schirmer in chloroform narcosis. The lenses were at once fixated in a concentrated solution of sublimate, hardened in alcohol of increasing strength to which a few drops of tincture of iodine had been added, treated with carbon bisulfid, imbedded in paraffin, and cut partly parallel, partly vertically to the course of fibers. The specimens were stained with hematoxylin and inclosed in glycerin or Canada balsam. The conditions found were: A nucleus pervaded with vacuoles and drops with concentric strata of fibers, then a zone of detritus, finally a small seam of lens fibers very much deformed and damaged in their protoplasmatic structure.

The interpretation of this total cataract as an extreme degree of zonular cataract explains the condition very naturally: A healthy

lens was started, as may be inferred from the normal concentric stratification of the central portions. At the time when the intermediate zone commenced to develop the lens met with some lesion, which not only destroyed the developing fibers almost completely, but affected the central portions, already formed, so that clinically the picture of total cataract was created, anatomically a nucleus, filled with drops and vacuoles. Everything that developed after this lesion became changed in two directions, viz.: The lens fibers developed from pathologic epithelial cells were opaque, as their protoplasm was infiltrated with minute granules, had a well-formed nucleus and did not grow longitudinally, but assumed all kinds of shapes.

The case is interesting, as it allowed to recognize indications of lens structure of the intermediate zone, whereas the cases of total cataract formerly published were examined at later stages, when the zone, most severely damaged, had been dissolved in homogeneous detritus. If in this case the lens had been left to itself, the intermediate zone and the nucleus would have been liquefied. Finally the liquid contents of the capsule are absorbed and a few dry remnants of the nucleus are left: membranaceous cataract has formed.

The histologic conditions are illustrated by very well-executed photos. C. Z.

A NOTE ON THE ETIOLOGY OF LAMELLAR CATARACT.—DUNN, JOHN, Richmond (*Arch. Ophthalm.*, September, 1907, xxxvi, 658), gives the history of a case of lamellar cataract occurring in a rachitic child, aged 6 months. There was a history of severe convulsions during the first three weeks after birth. When the case first came under observation there was a thin central opacity in both eyes and intraocular hemorrhages apparently caused by the convulsions. Examination, three months later, showed a normal red reflex with double lamellar cataracts. Dunn believes, from his observation of the case, that the convulsions caused the intraocular hemorrhages and thus caused nutritive disturbances that resulted in lamellar cataract. W. R. M.

FORMATION OF CATARACT.—GOLDZIEHER, WILHELM (*Budapesti Orvosi Upag*, Jan. 17, 1907). Cataract can not be considered as due to a disturbance of nutrition; it is due to a constitutional affection. The retrogressive metamorphosis which accompanies old age produces this constitutional anomaly; deleterious substances accumulate in the blood and the specific protective agencies in the eye

lose their effect. Cytotoxins gain access to the eye, particularly to the protoplasm of the lens, and there begin their process of destruction; the living cell becomes opaque and loses its function. J. G.

ON BOTTLE-MAKERS' CATARACT. —ROBINSON, W.M., Sunderland, England (*Brit. Med. Jour.*, Aug. 17, 1907). The writer refers to his previous paper (*Brit. Med. Jour.*, Jan. 24, 1903) in which he described the process of making ordinary bottles and showed that cataract was very frequent in ordinary bottle finishers, was posterior cortical in its early stages, was due to the excessive heat to which the eyes of the bottle finisher were exposed while at work, and could be prevented by the men wearing goggles. He was led to extend the field of his inquiries upon the appearance of a paper by Snell, of Sheffield, in which was stated that "there is not sufficient evidence to show that they (that is, bottle-makers) are liable to the affection (cataract) to such an extent as has been asserted." He pointed out that, unlike Professor Snell, his investigations were restricted to ordinary bottle-makers only, that is, those who make bottles of heavy material, such as whisky and wine bottles; an inquiry made four years ago had led him to believe that cataract is not specially frequent among flint bottle-makers (who make medicine and other lighter and better class bottles). Ordinary bottles are made at huge tanks which are heated with coal gas and are excessively hot (2,500° F.), and into the fierce heat of these tanks the bottle-maker must look. In flint bottle works the mode of working is quite different, and the heat is not nearly so great, being generated by coal fires; the bottle-makers in flint bottle works are, therefore not prone to cataract.

Of 400 men employed at the factories, 40 were known to have cataract; most of these were finishers; in two-thirds of these cases the eyes began to suffer from cataract by the age of 50. As the cataract nearly always begins close to the posterior pole of the lens which is near the nodal point, that is, the point through which all rays must pass which enter the eye without undergoing refraction (principal rays), the disturbance of vision is very great, though improvement in the sight may be effected by the use of atropin. Both eyes are almost always affected.

The disease usually begins as a posterior cortical cataract which differs from the ordinary posterior cortical cataract as described in text-books as follows: "1. Bottle finishers' cataract is a primary cataract, there being no posterior mischief except sometimes disturbance of retinal pigment, and when it is successfully removed the sight is good, though the workman is rarely able to resume work

as a finisher owing to the loss of power of accommodation. At its commencement it is like a cobweb in structure (and best seen with a + 10 or + 12 lens by direct examination) and saucer shaped, owing to the opacity being immediately within the posterior capsule. The outline is irregular, and not radial nor rosette shaped. Ordinary posterior cortical cataract is one secondary to disease of the vitreous, chorioid or retina, and consequently frequently occurs in the young, and after its removal the sight is bad. Moreover, the form of this cataract is at first rosette shaped or stellate, its center corresponding to the posterior pole of the lens, while its rays are directed radially toward the periphery (Fuchs). A posterior cortical must not be confounded with a posterior polar cataract; the former is a progressive disease of the lens substance, while the latter is a mere dot on the posterior surface of the lens capsule and represents the remains of the hyaloid artery when this vessel does not disappear completely; it is a congenital and stationary affection."

The writer believes that the excessive heat of the gas furnaces is the cause of the disease, an opinion borne out by the fact that the frequency of cataract in bottle-makers is in proportion to the extent and length of exposure of the eyes of the different classes of workmen to the fierce glare of the tanks. A shrinkage of the lens substance (drying) caused by the prolonged exposure to great heat may cause a slight separation of the lens fibers from the capsule first near the posterior pole, which would account for the opacity being first seen there and its peculiar saucer-like shape. The equatorial region being sheltered behind the iris, especially as the pupil is contracted by the bright light, escapes from the effect of the heat for a longer time than the cortex near the posterior pole. Cataract does not appear to be common among iron and steel workers, because the eyes of the men are not exposed to the heat which surrounds bottle finishers.

In his previous paper the writer recommended the wearing of dark-colored spectacles, because glass possesses the property of allowing only 30 per cent. of the heat rays to pass, and if the glass be dark colored many of the light rays are intercepted also. This suggestion has been adopted by many of the workmen and there is already a belief that the glasses have done much good. C. H. M.

FIVE HUNDRED CATARACT EXTRACTIONS FROM THE CLINIC OF PROFESSOR DIMMER, AT GRAZ.—HESSE, ROBERT. (*Zeitschr. fuer Augenheilkunde*, xviii, July, 1907, p. 21). Cataract extraction was combined with iridectomy under the following indications: Obesity.

high age, restlessness of the patient, tough, rigid iris, immature cataract, especially in monophthalmus, preliminary in glaucoma. Great stress was laid on asepsis, and a mouth veil was used. Cortical matter was removed by massage with the lower lid, the wound being covered by the upper lid. The patients stayed in bed one day, and, if possible, were dismissed before two weeks. Dissection with Knapp's knife was done subconjunctivally. Instillation of homatropin did not prevent iris prolapse, as was hoped. In 56 cases peripheral iridectomy was performed, in order to combine the advantage of a round pupil with guarding against prolapse of iris and against peripheral attachment of the iris to the wound, the most frequent cause of secondary glaucoma. The number of failures and the visual results spoke in favor of extraction without iridectomy.

C. Z.

REMOVAL OF LENS DISLOCATED INTO THE VITREOUS DURING CATARACT OPERATION YEARS PREVIOUSLY.—KOSTER, W., Leiden (*Zeitschr. fuer Augenheilkunde*, xviii, September, 1907, p. 220). The case showed that dislocation of the lens into the vitreous during cataract operation does not give an absolutely bad prognosis, as generally supposed. As this fatal accident may have happened or may happen to every operator, it is well to know that the prospects are not past all hope and that enucleation is to be performed only if compulsory. On the other hand, a lens in the vitreous is a very dangerous foreign body, and all means at extraction ought to be tried.

C. Z.

OPERATION ON INCOMPLETE CATARACTS.—VALUDE (*Ann. d'Oculistique*, June, 1907) divides incomplete cataract into two forms: 1, Ordinary lenticular cataract in which clear cortical matter surrounds an opaque nucleus. This always reaches maturity sooner or later. 2. Partial cataract in which opacification is shown by more or less numerous striæ, patches of opacity or dust-like whitish spots. These progress so slowly that the process may last for twenty years or more.

While it is always better to wait for natural and complete maturity it is not always convenient or desirable to do so. He judges the operation indicated when the patient can no longer read or go about alone comfortably.

As to the best procedure in these cases, he has tried extraction in the capsule and does not recommend it. He prefers artificial maturation followed by extraction and practices simple dissection with or without iridectomy. He frequently plunges the cysto-

tome deeply at the center of the pupil, making a posterior cystotomy after the manner of Hansen, and has not found that this incision causes loss of vitreous or special reaction.

When the performance of two operations is impracticable, he performs ordinary extraction with iridectomy and six or eight days afterwards reopens the wound, introduces the canula of a suction instrument and draws out the cortical masses, which have still little consistence at that time and are easily withdrawn. The danger of infection is not greater than after an ordinary operation.

G. C. H.

MAJOR SMITH'S OPERATION FOR EXTRACTION OF CATARACT IN THE CAPSULE.—WILLIAMSON, F., Rutter, India (*Ophthalmoscope*, October, 1907). The author has seen Major Smith perform 200 extractions in the capsule. He does not believe that the results obtained are to be attributed to any superior cleanliness on the part of the Punjab patients, nor to a lesser degree of conjunctival diseases. The operations are performed in a room opening into a dirty, dusty bazaar and with 40 to 50 patients huddled on the floor close around the operating table. The aseptic measures taken are to scrub the parts about the eye with 1-20 carbolic lotion and to irrigate the conjunctival sac with 1-2000 bichlorid, which flows from an irrigator holding some gallons of the solution. This is done with the speculum in position and the lids being held away from the globe. A point which he has observed and which Smith has not dwelt upon is that the eye is operated upon while it is rotated upward. He does not ask the patient to look down. The upper lid is so held up and retracted with a tenotomy hook that the lens is delivered easily underneath the lid. He performs an iridectomy after lens delivery by dimpling in the cornea close to its free edge with one limb of the ir's forceps, thus causing the edge of the iris to appear outside the wound; at the same time the other limb, which is resting on the sclerotic above, is slid along so that the iris is lightly caught in its grasp, pulled outside and cut off in the usual manner; the procedure being effected without the entry of an instrument into the interior of the eye. The loss of a small amount of vitreous is not a matter of importance in the final result. This accident, however, is guarded against by allowing the eye to rotate upward during the delivery of the lens. The wound being corneal does not give a greater degree of astigmatism, as one would expect, than more peripheral sections. The author believes the reason why infection is so rare with Smith is because only one instrument is introduced into the eye, namely, the knife. M. B.

EXTRACTION OF CATARACT IN CAPSULE AS PERFORMED BY MAJOR SMITH.—WILLIAMSON, F. RUTTER, Bhandara, C. P., India (*Journal Ophthalmology and Oto-Laryngology*, November, 1907). This is an interesting presentation of the conditions under which Major Smith does his work. Points worthy of general attention are the establishment of self-control on the part of the patient and the operator, technic which permits of the introduction of but one instrument into the eye, simplicity of aseptic procedures, and the necessity of the services of an intelligent assistant.

To those not especially familiar with the extraction of cataract in the capsule this paper is worth reading in full.

(This technic has become our choice in applicable cases. The results of the last twenty extractions of cataract in capsule were freer from complications, we believe, than had the capsule-laceration operation been performed and the vision obtained more satisfactory to the patients. There is obviously real risk of escape of vitreous, but in our hands fortunately vitreous escape was not harmful and not greater than under usual methods.—*Reviewer*.)

"In closing, it would seem to be good practice, *at first*, to avoid extraction in capsule of those bluish skim-milk colored lenses, which are known by experience to have very thin capsules; always to perform an iridectomy except in immature cataracts; to take plenty of time in the expression of the cataractous lens; and in every case where, after fair trial, the capsule seems certain to burst, to scratch it and to extract in the way most familiar to you."

H. V. W. AND S. G. H.

PROLAPSE OF IRIS IN SIMPLE CATARACT EXTRACTION.—ROPER, A. C., Exeter, England (*Ophthalmoscope*, October, 1907). For thirty years the simple extraction has been performed in the West of England Eye Infirmary. One hundred and fifty were performed by M. Bankart and 152 by the author. Iridectomy was performed only when the conditions before extraction absolutely demanded it or after extraction it was found indicated. Prolapse of iris followed in 7.27 per cent. of the cases in which the simple operation was performed. Many of these prolapses were excised early and all the effects of an iridectomy obtained. Where the prolapse occurred late it was not excised unless it was large, but was left to be dealt with in the cystoid sear later. The visual results obtained compare favorably with those of operators who perform iridectomy. M. B.

A METHOD OF EXTRACTING THE THICKENED AND OPAQUE CAPSULE SOMETIMES LEFT AFTER THE ABSORPTION OF TRAUMATIC CATA-

AFTER THE EXTRACTION OF OTHER COMPLICATED CATARACTS IN WHICH THE PUPIL IS USUALLY DILATED AND DISPLACED AND A DENSE WHITE MEMBRANE FILLS THE PUPILLARY AREA.—GREENE, D. W., Dayton, Ohio (*The Ohio State Medical Journal*, Nov. 15, 1907). For this operation the author uses a needle bent to form a right angle. The small part at a right angle to the shank should be about 2.5 mm. long, small and *very sharp*. Recent experience has satisfied the writer that a needle bent to less than a right angle or sickle-shaped with considerable curve would probably be as good. "Under local anesthesia the eyeball is firmly grasped with fixation forceps at the lower corneal border, the point of the needle is then forced through the periphery of the cornea from above on a line perpendicular to this part of its surface into the anterior chamber. This is done best by artificial light. It is very necessary to observe this direction in order that the point of the needle shall not plow between the layers of the cornea and not enter the anterior chamber at all. Considerable pressure is necessary to accomplish this, and it is by no means easy to tell when the point has penetrated the cornea. When the metallic luster of the point can be seen well within the chamber, the handle should be raised to the perpendicular and the pressure continued until the point touches the capsule, when it should be again lowered and the point forced into the membrane; then, by gently rotating the needle between the thumb and fingers as one rolls a cigarette, the capsule can usually be torn loose from its zonular attachment and will be wound around the point of the needle, from which it can be extracted through a small corneal incision on the temporal side with a small sharp or blunt-pointed hook, which is better than forceps, because it can be worked through a smaller opening. Usually little or no vitreous is lost, but the attempt to extract the capsule will not always succeed. The strength of the capsule itself may not be sufficient to withstand the traction necessary to break up its zonular attachment. In such a case the capsule will tear; some portion will come out with the hook, and the rest can usually be removed the same way."

After considering the possible dangers of this operation, the author says he thinks danger comes "from the direct pressure of the vitreous on the periphery of the iris, obstructing the angle when the anterior and posterior leaf or hyaloid are removed, and it is possible that the heavier specific gravity of the vitreous under these conditions may also aid in blocking the angle and secondary glaucoma result." While the capsule may be a source of endless trouble

after cataract extraction, yet it is believed that an eye with an unbroken posterior capsule is in better condition and freer from the pressure which may cause increased tension than one from which the capsule has been entirely removed.

The writer believes that his construction of the needle and method of using it are original, though all the other steps are very old. He describes a somewhat similar operation performed in 1893 by Dr. Henry W. Bradford, and says that Dr. Charles A. Oliver, in 1894, made practically the same operation with the same kind of needle without any knowledge of Dr. Greene having long before made the operation. It is advisable in only a few cases, but in the ten cases in which Dr. Greene has used it healing has been normal, and he says he knows of no operation which so well both restores cataract vision and removes a serious blemish from the eye.

M. D. S.

MEDICAL AND SURGICAL TREATMENT OF TRAUMATIC CATARACTS.—LIBBY, G. F., Denver (*Denver Med. Times*, July, 1907, xxvii, 8). In conjunction with other medical treatment, Libby advocates the use of dionin, in 1 to 5 per cent. solution, in cases of traumatic cataract where the lens capsule is ruptured or after discissions for cataract. The author finds that the use of dionin hastens absorption, and he continues its use until absorption of the lenticular cortex is complete.

W. R. M.

CHORIOID.

CHORIOIDAL DISEASES; THEIR RELATIONS TO GENERAL DISEASES AND PARTICULARLY TO INFECTIONS, INTOXICATIONS AND ATOINTOXICATIONS.—DE SCHWEINITZ, G. E., Philadelphia (*Annals of Ophthalmology*, October, 1906), summarizes his paper as follows:

1. That while syphilis is undoubtedly the most frequent cause of those forms of chorioiditis which depend upon specific infections, it is by no means an exclusive cause, and that many cases which were once supposed to be syphilitic have undoubtedly other etiology, notably tuberculosis, and probably in not a few instances other specific infectious diseases, for example, typhoid fever, influenza and pneumonia.

2. That while there is no known type of chorioiditis which is pathognomonic of the disease of any single organ, as, for example, certain types of retinitis or of certain chronic diseases of the kidney, it is not unlikely that affections of the blood in the form of

various anemias, and notably of the kidney and probably of the liver, may at times be the source of the infection which causes a chorioiditis, and that the same is true of certain diseases of nutrition, particularly gout, varieties of chronic rheumatism, and in general terms the lithemic state, not always in the sense that a specific form of chorioiditis is elaborated, but that the same cause may produce a change in the retinal blood vessels, and that the two affections may be combined.

3. That much evidence accumulates that certain infections, particularly those derived from ptomain poisonings, as well as enterogenous autointoxications, must be given a distinct position in the etiology of chorioiditis, and that, finally, it is not unlikely that some cases of chorioiditis depend upon an infection which finds its way through the tonsillar tissue into the lymphatic system of the neck and ultimately into the chorioid, or, if not through the tonsillar tissues, through those of the nasopharynx. Pyorrhea alveolaris may also be a source of infection.

4. That each case of chorioiditis not definitely syphilitic in origin should receive a study which includes the most searching general examination, notably of the secretions of the body and particularly of the intestinal tract, in order that perfunctory therapeutics, including simply the various alteratives, notably the iodids, may give place to rational measures developed by the results obtained.

M. D. S.

CIRCULATION.

CONTRIBUTION TO THE THERAPY OF EMBOLISM OF THE CENTRAL RETINAL ARTERY.—FEJÉR, J., Budapest (*Centralblatt fuer Augenheilkunde*, August, 1907, p. 231). Supplementing his case of partial restoration of sight in a case of embolism of the central retinal artery by massage (*Centralblatt fuer Augenheilkunde*, August, 1906), Fejér reports another one with complete recovery of vision: A laborer, aged 52, came to the hospital with the typical ophthalmoscopic picture of embolism. The blood vessels were very narrow, the retina extensively opaque with characteristic red spot at the macula. Massage of the eyeball in circular direction was at once applied, a bandage put on, and iodid of potassium given internally. The patient saw absolutely nothing for three days; gradually vision returned, was three weeks later 5/xx, eight weeks later 5/v (?), and the patient read smallest type with + 5 (hypermetropia and presbyopia). The at first concentrically contracted visual field showed at the end of the treatment a contraction downwards and outwards of 15°. The vessels were a little narrower and the temporal half of the optic disc slightly pale; the red spot

at the macula had disappeared. Urine was normal, the arteries moderately rigid, heart sounds dull, but no murmur.

Massage aims at the disintegration, mobilization and atrophy of the embolus and the expansion of the walls of the blood vessels. Others ascribe to it acceleration of circulation and evacuation of lymph and decrease of intraocular tension. The results depend on the speedy application of massage, as, immediately or a few hours after the attack, the embolus is so soft that the more rapid circulation may carry it farther or may not act favorably on its disintegration.

Pneumatic chamber and inhalation of oxygen, recommended by Schapringer, act in the same way as massage. C. Z.

CONJUNCTIVA.

THE PROPHYLAXIS OF OPHTHALMIA NEONATORUM.—LEWIS, F. PARK, Buffalo (*The Amer. Jour. of Ophthalmology*, October, 1907). The writer gives the following conclusions on this important topic: 1. That the responsibility for the control of ophthalmia neonatorum rests with the state and should find its expression through the department of public health. 2. The duty of pointing out its dangers, its prevalence, its prophylaxis and its treatment and suggesting measures for its relief through the proper channels remains with the medical profession. 3. To wipe out this disease as a cause of blindness the public must be better informed concerning it, through various social organizations, the material coming from some authoritative body like the American Academy of Ophthalmology. 4. To accomplish effective work a concerted effort should be made to secure uniform laws governing the midwives in the several states and in federal territory, such as exist in many European countries, and putting them under the surveillance of the department of public health. If the midwife is to be held responsible for a failure to employ prophylaxis it is only just that a pure and safe preparation be put in her hands. The centralization of the authority for the control of the midwives in the state department of health would contemplate an examining board and registry for these women in every county of each state.

"A disease occurring sporadically and which is endemic can be controlled only by organized and concerted effort. It is most important, therefore, in order that no false move be made, that the procedures to be determined upon should originate with the ophthalmologists and obstetricians. Their practicability must be assured by those expert sanitarians engaged in public health work. Then the measures recommended should be carried out by an or-

ganized movement in every state in the Union. A state committee should be appointed and through this should be secured the appointment of a like committee in each county. This latter body would ultimately become the board of examiners for midwives. It would be most desirable if in every instance the local health officer should be a member of this committee. Such a general and concerted effort made throughout the country would in a comparatively short time so limit infections and improve methods of treatment that the disasters following ophthalmia neonatorum would practically cease—that this prolific cause of blindness would be controlled—millions would be saved to the commonwealth and the happiness and efficiency of humanity enormously augmented.”

C. H. M.

CONJUNCTIVITIS WITH ADENOPATHY.—TROUSSEAU (*Ann. d'Oculistique*, June, 1907) describes a case of conjunctivitis similar to Parinaud's in extensive granular involvement, but differing in the absence of true villitis and in rapid recovery. There were merely a thickening of the mucous membrane and small granulations at the external angle. Inoculation experiments gave negative results. He thinks that adenopathies in connection with ocular affections should not be considered unless they are decided, as slight adenitis, if carefully looked for, can frequently be found in various palpebral and conjunctival affections. He does not contend that these conjunctivites accompanied with adenopathy are not infectious, but only that there are other forms of conjunctivitis of more marked infectious character to which this term is not applied.

G. C. H.

CHANCROIDAL CONJUNCTIVITIS.—CRISP, J. D., Denver, Colo. (*Denver Med. Times*, July, 1907, xxvii, 14), reports a case of infection of the eye resulting in ulcer of the cornea and loss of sight. Infection occurred during an attempt, by a companion, to remove some dust from the patient's eye, the infection being conveyed through the medium of the fingers. His companion, at the time, had several chancroidal ulcers.

W. R. M.

A CASE OF PURULENT CONJUNCTIVITIS IN AN INFANT IN WHICH FREQUENT INSTILLATIONS OF A TWO PER CENT. SILVER NITRATE SOLUTION WERE EMPLOYED FOR SEVERAL DAYS; RECOVERY WITH BUT SLIGHT OPACITY OF THE CORNEÆ.—NANCE, WILLIS O., Chicago (*Journal of Ophthalmology and Oto-Laryngology*, October, 1907). Purulent conjunctivitis was contracted on the third day

following birth, treated irregularly at home by the instillation of 2 per cent. silver nitrate solution (without irrigation) for a week before consulting the writer. When seen by him "the eyelids were swollen to such a degree as to render exposure of the eyes next to impossible. The integument of the lids was stained a dirty black, and in certain areas was entirely denuded. The bulbar conjunctiva was markedly edematous, black, and the entire surface bled readily. The right cornea was so opaque as to occlude all view of the iris; the left was much the same except that the degree of opacity was slightly less. Both corneæ presented the white glazed appearance seen clinically after a burn by lime. There was a moderate yellowish discharge from both eyes. . . . Two special nurses were put in charge of the case. The eyes were flushed with boric acid solution, atropin in oil was instilled, and sterile vaselin was frequently applied. Examination for the gonococcus was negative." Within two weeks "the discharge had almost ceased and the swelling had almost entirely disappeared. Yellow oxid of mercury ointment was ordered, and moderate massage was practiced for several minutes, at first every other day and later daily. . . . At the end of two months the corneæ had markedly cleared, and seven months later there was but a faint superficial peripheral opacity of the right cornea and a slight opaqueness of the left that could be discerned only by the aid of artificial light, in neither instance sufficient to interfere with vision."

H. V. W. AND S. G. H.

CORNEA.

EXTIRPATION OF THE GASSERIAN GANGLION AND NEUROPARALYTIC KERATITIS IN MAN.—WEISS (*La Clinique Ophthalmologique*, Sept. 25, 1907). The case Weiss reports is of interest, having, as it does, a control value on the theories in regard to Gasserian ganglion ablation. The patient was 47 years old; he stated that following a tooth extraction he had suffered for six years severe left-sided neuralgia; the pain become insupportable, he was advised to have exsection of the Gasserian ganglion, and that was done. Patient consulted Weiss for a correction of presbyopia. The man complained of excessive perspiration which came on regardless of work, which had not occurred prior to the operation; at night occasionally had facial pain; there was insensibility in the region of the eye; did not feel the presence of a foreign body on the conjunctiva; during mastication was unable to feel food in left side of mouth. The right side of face was slightly red and the perspiration was quite apparent on it, while left side was but slightly humid. Sensation was absent over the zone of the trigeminus.

slight left ptosis; eyes could be completely closed; no enophthalmos. There is a slight tremulousness of some of the left orbicularis fibers; lubrication of each eye similar. There is no inflammation of either eye; no deviation of the eyes and no delimitation of ocular movements; pupils equal, circular and mobile. The cornea is absolutely insensitive, but perfectly transparent; fundus normal. Acuity of vision, right eye 5/v; left eye 5/iv, with + 2 binocular vision at the normal distance. The interest in the case is that the patient, after a complete section of the trigeminal, the cornea remained clear for more than four years and that there was no trace of neuroparalytic keratitis. The fact has been elsewhere reported by Krause that extirpation of the ganglion of Gasser is not followed in man by keratitis, thus contradicting the atrophic theory of Magendie. The mechanical theory of Snellen and the theory of dryness of Feuer and others allow an explanation of the fact why neuroparalytic keratitis in man after unilateral extirpation of the ganglion is so rare. The winking reflex and secretion reflex being so feeble that they may have for their source the sound side to answer for the insensible one as against desiccation and gross traumas, as in the case of Krause and the author; though Seydel, in order to combat the dryness theory, reported a case in which there was no neuroparalytic keratitis, in spite of a bilateral paralysis of the trigeminal.

If it is admitted by Buttner that the insensible eye is specially exposed to trauma, it is difficult to comprehend, the author states, in his case—the patient being a goldsmith, was certainly frequently exposed to slight injuries—why there has been no corneal lesion.

The conclusion of the author is that neuroparalytic keratitis is rare after extirpation of the Gasserian ganglion. B. E. F.

GENERAL DISEASES AND VISUAL ORGANS.

LEPRA OPHTHALMICA IN CEYLON.—DE SILVA, W. H., Colombo (*The British Med. Jour.*, Nov. 2, 1907). The Leper Asylum in Ceylon now contains 500 cases, and, of these, 101 patients suffered from lepra tuberculosa, 33 from lepra anæsthetica, and 45 from lepra mixta. The most important lesion in lepra tuberculosa was a tuberculous episcleral growth which usually started on the outer circumcorneal region, and it took months to involve the cornea, while the pupil became irregular and showed a tendency to be dragged towards the nodule. The average duration of these cases was nine years. The vision remained remarkably good, and in five only was it much affected. Lepra anæsthetica had an average duration of fourteen years; the patients were older and the disease

lasted longer, one patient being 87 years of age, and he had suffered from it for forty-five years. Most of the corneal complications were due to lagophthalmos, the result of facial paralysis. The commonest specific lesions were found only in lepra tuberculosa, but the percentage was small. In lepra anesthetica there was no primary lesion in the eyes. The few cases in which cataract was noticed did not give a higher percentage than the same class of people in Ceylon generally. He gave details of 17 typical cases.

C. H. M.

DISEASES OF THE EYE, EAR, NOSE AND THROAT AMONG PERSONS AFFLICTED WITH LEPROSY.—HOLLMANN, H. T., Hawaiian Island (*New York Med. Jour.*, Oct. 26, 1907). In his report to the Hawaiian Territorial Board of Health giving a résumé of his work, the writer calls attention to the leprous conditions of the eye as follows: There were four cases of ptosis; fifty-five examples of ectropion; some forms of conjunctivitis associated with edema of the lids; formation of tubercles in the eyelids; a few cases of symblepharon; frequent occurrence of simple ophthalmia; so-called leprous ophthalmia; a few cases of ophthalmia neonatorum; many instances of corneal ulceration, vascular keratitis and iritis; retinitis in a few patients, terminating in complete loss of sight after suffering excruciating pain.

He describes a "leprous pterygium like pannus" as follows: "There is among a few of our patients a peculiar condition which I can only describe and not name, as I can find nothing analogous in any text-book on diseases of the eye. For convenience sake I have called it a leprous pterygium associated with pannus. It starts undoubtedly as a leprous tubercle of the chorioid coat which finally disintegrates and ulcerates externally; subsequently from this point a hypertrophic overgrowth extends to and gradually involves the cornea. It is plentifully supplied with blood vessels; hence a condition of pannus. When once it has completely involved the cornea, there is no hope for vision, except possibly through an iridectomy. If the condition is seen in time we can arrest its progress, but for how long we do not know, as it has been only for the last year that we have attempted to arrest it."

Leprous tubercles are found in the chorioid coat in certain cases; these appear as small yellowish spots and surrounded occasionally by a slightly inflammatory area. It is very difficult to discover these small tubercles of leprosy, requiring repeated ophthalmoscopic examinations. Tubercles of the chorioid when of a large size often disintegrate and ulcerate externally.

C. H. M.

BLINDNESS FROM CEREBRAL THROMBOSINUSITIS FOLLOWING PHLEGMONOUS TONSILLITIS.—SEGGER, K., Muenchen (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, August-September, 1907, p. 129). In a robust soldier, aged 20, an acute intense exophthalmus of right eye with swelling of lids and chemosis developed under headache, chills, vomiting and intermittent fever, together with violent phlegmon of the right tonsil, which subsequently recurred several times. Almost simultaneously blindness and immobility of the pupil of the right eye set in, soon followed by the same symptoms on the left eye, however without exophthalmus. Two days after the occurrence of exophthalmus the right internal jugular vein was felt as a hard coil. On the thirty-sixth day of the disease a relapse of tonsillitis was accompanied by lung affections. Under mercurial inunctions the patient recovered within 2½ months, with atrophy of both optic nerves, total amaurosis of right eye and the preservation of a sector in the upper nasal quadrant of left eye. The diagnosis was thrombosis of the orbital veins with or without thrombosis of the cavernous sinus.

The connection with the tonsil is this: The venous blood of the tonsil flows through the palatine vein into the internal jugular, above the entrance of the external jugular, communicating with the cavernous sinus indirectly through the superior petrosal sinus and transverse sinus, directly through the inferior petrosal sinus which anastomizes with the bulb of the vein. Apparently a thrombophlebitis of the palatine vein, caused by the purulent tonsillitis, was propagated to the cavernous sinus and the ophthalmic veins, creating the right exophthalmus. Through the circular sinus of Ridley the left cavernous sinus and the intracranial portion of the ophthalmic vein were reached, perhaps by partial thrombosis, as there was no exophthalmus of left eye. The case is exhaustively discussed, with a review of similar cases from literature. — C. Z.

CHANGES OF THE FUNDS IN MORBUS MACULOSUS WERLHOFII.—SCHULTZE-ZEHDEN, P., Berlin (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, July, 1907, p. 73). A woman, aged 26, had ecchymoses on the legs and severe uterine hemorrhages, which could not be controlled by curettement and caused immense anemia. Suddenly the left eye became blind; the fundus showed numerous retinal hemorrhages, and the optic nerve was snow white, the vessels very narrow. Then the sight commenced to fail in right eye, in which preretinal hemorrhages were detected, with pallor of the optic nerve. Vision was reduced to 1/3. Schultze-Zehden attributed the sudden blindness to hemorrhages in the optic nerve which

interrupted the conduction and destroyed the nerve. They could not have been very profuse, as there were no symptoms of choked disc.

C. Z.

AFFECTION OF THE OPTIC NERVE AND MULTIPLE SCLEROSIS.

FLEISCHER (*Wiener Medizinische Wochenschrift*, Aug. 24, 1907). Multiple sclerosis is to be suspected when young individuals become affected with an acute neuritis optica, which is followed by a rapid recovery, and no etiologic factor can be discovered. Of 24 cases of retrobulbar neuritis, 6, and possibly 10, cases became affected after a few years with multiple sclerosis; of 14 cases of optic neuritis, 3 had multiple sclerosis, and of 39 cases of sclerosis 13 showed a pale papilla, 10 a dim one, and in 16 the papilla was absolutely normal.

J. G.

SOME OF THE RARER OCULAR LESIONS ASSOCIATED WITH GOUT AND GENERAL LITHEMIA.—BULL, CHARLES STEDMAN, New York City (*Ann. Ophthalm.*, April, 1907). In gout uric acid is found in the blood. Just before an acute attack of gout the urine may show a diminution in uric acid elimination and after the attack the excretion may be excessive. High blood pressure and gout go together. Arterial sclerosis is responsible to both for its causation. Intestinal fermentation is largely responsible for the uric acid state. Attention is called to the following ocular diseases, which are directly and indirectly due to the lithemic condition, conjunctivitis, edema of the eyelids, chorioiditis, retinitis, optic neuritis and affections of the ocular muscles. Some of these ocular lesions are the forerunners of an acute explosive inflammatory attack elsewhere in the body. When this occurs the eye lesion promptly gets well. In conjunctivitis the appearances are congestive rather than inflammatory and the symptoms are those of a vasomotor disturbance. No secretion. Local treatment is not of service. The attack lasts about a week when it is succeeded by an explosive inflammatory attack of arthritis in the toes, ankles or wrist-joints. Diffuse edema of the eyelids involves all four of the lids, but is worse in the upper lids. The conjunctiva is not involved. The lids are sometimes hard and tense. Symptoms of an acute arthritis develop in a few days and the edema disappears. In chorioiditis, retinitis and optic neuritis we are dealing with the degenerated arteries and veins and high blood pressure so common in advanced lithemia. In paralysis of the ocular muscles the external rectus is the one usually involved. It is usually transient and clears up quickly when an attack of inflammatory gout appears.

The treatment will vary with the age of the patient, the nature of the lesion, and the severity of the type. It has to do primarily with the habits of life, more or less modified by the patient's condition and environment, but is also largely dietetic; medication is relegated to second place in importance. M. B.

MIKULICZ'S DISEASE IN RELATION TO LUES.—GUTMANN, ADOLF. (From the eye clinic of Prof. J. von Michel in the University of Berlin. *Berliner Klinische Wochenschrift*, 1907, No. 36, p. 1141.) A man, aged 24, presented the aspect of Mikulicz's disease three years after syphilitic infection: swelling of both lacrimal glands, redness and mucous secretion of the conjunctiva, which was covered with numerous follicular granules of the size of a pin's head, intense swelling of parotid, submaxillary and sublingual glands on both sides. The blood was normal, with slight increase of lymphocytes. Under roborating treatment and large doses of iodid of potassium, the swelling of the glands subsided entirely within three months.

In a review of the incident literature, Gutmann shows that this was the first case in which this disease was unquestionably proved in lues and a perfect success was obtained by antisyphilitic treatment. C. Z.

TUBERCULOSIS AS AN ETIOLOGICAL FACTOR IN CHRONIC INFLAMMATIONS OF THE EYE. ESPECIALLY CHRONIC UVEITIS.—STOCK, Freiburg (*Graefe's Arch.*, lvi, H. i, July, 1907). It is possible to give the author's summary only of his paper, which is a contribution in experimental, pathologico-anatomical, clinical and therapeutic observations. By inoculating rabbits with pure culture of tuberculin introduced into the blood stream, he observed changes in the eyes of such animals in many respects similar to those observed in man in chronic uveitis, and he has seen occur a chronic iritis with nodular formations, a cyclitis and a chronic disseminated chorioiditis. In all of these cases the anatomico-pathological findings *were not typically tuberculous*, but the positive demonstration of tubercle bacilli in the preparation and the results of the inoculation experiments make him believe that he had to do with changes which could be produced only by the tubercle bacillus. Besides, he has observed a scleritis and a scleritizing keratitis, both changes originating from a tuberculous chorioiditis and cyclitis. Small nodules in the conjunctiva and chalazion-like tuberculosis of the tarsus were generated through the blood. From these experimental results the author has endeavored to determine in how

far tuberculosis is an etiologic factor in chronic iritis of man. The attempt to inoculate rabbits with fragments of iris, as well as with aqueous humor, was without results in 25 instances. Nevertheless the author believes that in tuberculous reaction (T. V.) we have an aid in diagnosis which should be applied in all cases of chronic uveitis. Should the patient not react and should there be present another possible cause (rheumatic, lues, etc.), then the iritis is not to be considered tuberculous. Should, i. e., a syphilitic or rheumatic patient react we should nevertheless assume these to be the etiologic factors. If treatment directed to these affections is without result, then it is permissible to consider the condition to be of tubercular origin. The writer considers the process tubercular if the patient react locally, or, if associated with only general reaction, there are small, scarcely visible nodules with gray exudate, or only thickening of the iris in the smaller circle visible with the binocular loupe. These small nodules in the lesser circle of the iris, in most cases only visible with the binocular loupe (with positive general reaction to tuberculin, T. V.), the author holds as characteristic of tuberculosis. These phenomena were frequently noticed in animals after experimental blood infection with tuberculosis. Similar changes were never noted in iritis of other origin.

He considers syphilitic iritic eruption easily of differentiation from the above. In the former there is marked irritation of the entire eye, whereas in tuberculosis even a pericorneal injection may be wanting. The syphilitic papule is red-brown, whereas the nodule is at most a grayish elevation above the surrounding tissue. One must, however, in every case of chronic iritis repeatedly examine with the binocular loupe.

The pathologico-anatomic examination of eyes removed for chronic iridocyclitis present no positive diagnostic points of tuberculosis (bacilli were never found). This is explained, in part, by the scantiness of the material and from the fact that many of the specimens were not fresh.

He considers tuberculin (T. R.) by far the best and safest method of treating chronic iridocyclitis of tubercular origin.

The only available explanation of an eye showing no recent changes, but giving a local reaction to T. R., is that the disease process has been latent and the tubercle bacilli have become encapsulated in the tissue. Relapses are caused by any factor which would liberate any such latent virus and excite new inflammatory phenomena.

W. Z.

INCOMPLETE PARALYSIS OF ACCOMMODATION OF BOTH EXTERNAL RECTUS MUSCLES AND OF THE RIGHT ORBICULARIS OF DIPHTHERITIC ORIGIN.—FEVRIER (*La Clinique Ophthalmologique*, Sept. 25, 1907). The patient entered the hospital Jan. 5, 1907, for diphtheria; had the usual diphtheritic conditions. An injection of antidiphtheritic serum of 20 c.c. was given the same day, and on January 8 a second injection of 10 c.c. was administered. On January 10 the first symptoms of paralysis appeared in the velum palati; there was the nasal voice, and when attempts at swallowing fluids were made they returned in part through nares. A month after convalescent from the attack the ocular paralyses appeared, patient complaining of not being able to read longer than five minutes; after a few moments could read again, to be followed by further inability to do so; distant vision normal. There was slight convergent strabismus due to paresis of both external recti. Patient was emmetropic. Vision in each eye 1. Pupils moderately dilated, but contracted under influence of light. Right orbicular muscle was partially paralyzed. By March 29 all visual troubles had been removed.

B. E. F.

OCULAR MANIFESTATIONS OF LOCOMOTOR ATAXIA.—TIVNEN, RICHARD J., Chicago (*The Journal of Ophthalmology and Otolaryngology*, June, 1907). The writer briefly reviews the literature and summing up a triad of the chief ocular findings "consisting of the Argyll-Robertson pupil, atrophy of the optic nerve, and ocular palsies."

H. V. W. AND S. G. H.

GLAUCOMA.

PATHOGENESIS OF GLAUCOMA AND THE RATIONALE OF ITS TREATMENT.—HENDERSON, THOMAS, Nottingham (*The British Med. Jour.*, Nov. 2, 1907). This is a preliminary communication on the subject. The author holds that the causal factor of glaucoma exists in a primary obstruction and closure of the pectinate ligament, due to sclerosis of the fibrous structures about the filtration area, and that all other changes are secondary to this. He then describes the anatomy and physiology of the parts involved. The hindrance to the aqueous outflow does not arise from the peripheral anterior synechia so frequently met with in glaucoma, which he looks upon as secondary only, but it is caused by the closure of the interspaces of the pectinate ligament in consequence of the fibrosis of the cells of its connective tissue stroma and the formation of a homogeneous membrane around these fibrous bundles; this leads to the endothelial cells being first brought into con-

tact and then welding together the fibrous structures. In addition, the iris is not only a diaphragm, but an absorbing surface accessory to the pectinate ligament, and when the latter is obstructed the iris has to do the whole of the drainage. When the pupil becomes dilated, its area becomes lessened and the crypts near the pupil become closed, thus the blocking of the angle of the anterior chamber is a consequence of the acute iritic edema, and not the cause of the glaucoma. The edema of the ciliary body relaxes the suspensory ligament, thus allowing the lens to become more globular and consequently causing shallowing of the anterior chamber. By modifications in these processes, acute, subacute and chronic glaucoma are explained. The reasons why miotics caused diminution in tension is because the crypts on the surface of the iris open and the aqueous is able to find its way out; mydriatics cause the reverse of this. After an iridectomy, the stump of the iris shows no signs of healing, and even years afterwards the appearance of the cut edges is as if the operation had been done postmortem. Thus the operation opens up permanent channels by which the fluid can drain away, and this will always be effective unless the iris tissue is too much atrophied and degenerated.

C. H. M.

ON THE VALUE OF IRIDECTOMY IN GLAUCOMA SIMPLEX.—VON HIPPEL, A., Goettingen (*Klinische Monatsblaetter fuer Augenheilkunde*, xlv, July, 1907, p. 58). To form a correct opinion on the value of iridectomy in glaucoma simplex it is absolutely necessary to re-examine the patients operated on from time to time at longer intervals. The statistics as to operations for glaucoma become more unfavorable the longer the period in which the cases are observed. von Hippel performed, within the last fourteen years, iridectomy 65 times, sclerotomy 6 times, iridectomy with subsequent sclerotomy 3 times on 58 patients with 74 glaucomatous eyes. He was enabled to gather definite reports on 66 eyes. If in concordance with other statistics those are considered as cured which showed no deterioration after at least two years, their number was 27 (41 per cent.). Of these, 12 had been under observation for from two to five years, 9 from five to ten years, 6 from ten to fourteen years. They included eyes with considerable contraction of the visual field and marked excavation of the disc. Nine (14 per cent.) were "preliminary" cures, of which 6 showed no functional impairment in from one to two years, 3 in less than one year. In 17 (26 per cent.) vision gradually decreased, but not completely. In 8 of them from one to five years had elapsed, in 6 from five to ten years, in 3 from ten to thirteen years. In these the value of

iridectomy is not to be underrated, considering that they were, without exception, cases with considerable contraction of the visual field, diminished vision, excavation, often with atrophic discoloration of the disc, and that more than half of them had grown blind in the other eye from glaucoma without operation. Blindness set in from one to five years after iridectomy or sclerotomy in 13 eyes (20 per cent.), which had shown extreme defects of the visual field, deep excavation and atrophy of the disc. If in one-half of these desperate cases almost useful sight was preserved for from three to five years, it was merely due to iridectomy.

von Hippel's results with iridectomy correspond exactly with those of Albrecht von Graefe, communicated in his last elaborate essay on glaucoma: normal tension and stable in more than one-half of the cases, in one-fourth tension became not perfectly normal and vision commenced to decrease after years, but in some was preserved by a second operation. In a third category the action of iridectomy was insufficient from the start, but the failure of vision was retarded by it. Neither miotics nor sclerotomy can supplant iridectomy. The earlier iridectomy is performed the better its effect; it is recommended also in far advanced cases, as it decidedly delays blindness.

C. Z.

OBSERVATIONS ON SENILE CATARACT WITH SECONDARY GLAUCOMA.—ULBRICH, HERMANN. (From the eye clinic of Professor Elschmig in the University of Prag. *Zeitschr. fuer Augenheilkunde*, xviii, 1907, p. 133.) In his paper on secondary glaucoma in intumescent senile cataract (reviewed in the last number of OPTHALMOLOGY), Hesse mentioned, besides his two cases, only one from literature. Ulbrich reports in detail three cases and refers to three cases in a former publication by Elschmig which took a favorable course after primary extraction.

Cataract in an intact capsule and glaucoma may have the following connections:

1. In an eye which has become blind from glaucoma, cataract develops from disturbances of nutrition of the lens.
2. An eye affected with senile cataract becomes glaucomatous, or in an eye affected with glaucoma not too far advanced senile cataract develops. There is no causal connection between both diseases.
3. The cataractous lens causes glaucoma by swelling. In the cases of Hesse and of the author the increase of tension was removed by iridectomy and, after healing of the wound, the cataract was extracted.

The possibility of intraocular hemorrhage in direct extraction.

i. e., without preliminary iridectomy, suggests the advisability of iridectomy, followed later on by extraction. C. Z.

CONTRIBUTION TO THE THERAPY OF GLAUCOMA.—BJERRUM, J., Copenhagen (*Centralblatt fuer Augenheilkunde*, August, 1907, p. 225), reports the results obtained on 14 eyes with glaucoma simplex and 10 eyes with buphthalmus by sclerotomy with very peripheral contrapuncture. Three of the former were cases of far advanced absolute glaucoma and could be observed only for a week. In 10 of the remaining 11 and in 8 of the buphthalmic eyes the results were good. Bjerrum claims as advantages of his method the cutting of the iris periphery and the insertion of the ciliary muscle, of a thinner part of the sclera than in the usual sclerotomy and opening of the suprachorioidal space. C. Z.

EXPERIMENTAL GLAUCOMA AND AN EXAMINATION OF GLAUCOMATOUS EYES OF ANIMALS.—ERDMANN, Boestock (*Graef's Arch.*, lxi, H. ii and iii, July and September, 1907). As a result of these studies Erdmann concludes:

1. By means of the methods adopted permanent increase of tension, with its consequent conditions, was induced in about 75 per cent. of the rabbits' eyes experimented upon.

2. The increased tension is the result of the destruction of the anterior channel of filtration through obliteration of the angle of the anterior chamber.

3. The latter condition is brought about through a proliferating inflammation of the filtration tissue of the angle of the chamber excited by the fine granules of iron driven into the meshes of the tissue by electrolysis.

4. Glaucoma excited in this way resembles infantile glaucoma of the human eye. The most important corresponding symptoms are the following: *a.* A stretching and simultaneous compensatory tissue increase in the external coats of the eye with a corresponding more or less pronounced increase in size of the eyeball in which the anterior segment principally participates. *b.* A flattening of the cornea which is due to a meridional increase in which the vertical meridian preponderates. *c.* Tearing of Descemet's membrane as a result of stretching.

5. The atrophy of the chorioid and retina in glaucomatous rabbits' eyes, which is almost entirely limited to the anterior segment of the eye, where the stretching is greatest, is a result of continued tension increase.

6. The more or less pronounced deep excavation which usually

extends to the periphery of the nerve is to be considered as a pressure excavation.

7. Sudden release of tension in glaucomatous eyes in rabbits induced by puncture of the anterior chamber can have as a result extensive retrochorioidal hemorrhage and detachment of the retina.

8. Mydriatics produce an increase and miotics a decrease in tension in glaucomatous eyes of rabbits.

9. Flourescein used intravascularly reached the anterior chamber of the glaucomatous eye sooner than it did the sound eye of the same animal.

10. The aqueous of glaucomatous eyes is, in contrast with the normal eyes, rich in albumin. This increase must be considered as a result of the increase in tension.

11. Hemolysin apparently does not reach the "first" aqueous of glaucomatous eyes.

W. Z.

CLINICAL AND THERAPEUTIC CONSIDERATION ON BUPHTHALMIA.—ABADIE (*Ann. d'Oculistique*, June, 1907). The hope that iridectomy might at least check the progress of congenital hydrophthalmia has failed, and miotics accomplish but little, and the author claims that this is due to the fact that in congenital hydrophthalmia the hypertension and excavation are the results of chorioretinitis. This chorioretinitis, usually limited at first to the equatorial region, is likely to escape detection, but always exists. Convinced that this is the real pathology, he has treated a number of cases with intramuscular mercurial injections or mercurial inunction and claims a remarkable success in improving the vision and reducing the size of the globe.

He does not advise the entire abandonment of paracentesis or iridectomy, but insists that these operations should be only the complement of a treatment directed against the chorioretinitis.

He gives intramuscular injections of six drops of a 1 to 100 solution of cyanid of mercury daily.

G. C. H.

INJURIES.

INJURIES OF THE EYE.—AYRES, S. C., Cincinnati (*The Lancet-Clinic*, July 20, 1907), describes the removal of foreign bodies from the cornea, warns as to the infections sometimes following, and discusses the treatment of incised wounds of the cornea with prolapse of the iris. After discussing the use of the magnet in removing foreign bodies from the iris, he describes the treatment that may be required when the lens is wounded, becomes swollen, and secondary glaucoma develops. After removal of the foreign

body, if the eye is painful, the iris pressed against the cornea, and the intraocular tension increased, the softened lens substance should be removed at once by means of a broad incision with a spear knife. By pressing the lip of the wound with a Daviel spoon enough lens substance should be removed to relieve the abnormal tension. Atropin should be used till active symptoms have passed.

When intraocular hemorrhage or cataract prevent the location of foreign bodies in the vitreous, the *x*-ray is necessary. When pieces of metal entering through the sclera pass in obliquely, there is always doubt as to where they may be located. A case is cited as an example of this difficulty. The great advantage of the *x*-ray in locating foreign bodies is emphasized, and statistics of results with the eye magnet are given.

M. D. S.

NOTES ON A SERIES OF CASES ILLUSTRATING THE LATE RESULTS OF BIRTH INJURY TO THE VISUAL ORGANS.—THOMPSON, ERNEST and BUCHANAN, LESLIE, Glasgow (*Ophthalmoscope*, August, 1907). Three cases are reported of linear opacities on posterior surfaces of corneæ caused by forceps' injuries at birth. Two of these cases had high degrees of astigmatism and very poor vision. A case is reported of convergent strabismus and nystagmus caused by some injury to external rectus at birth. Three cases were all forceps deliveries. The exception was that of a 4-months-old baby whose eyes were rotated upward and to the left with jerking movements at intervals. Optic discs were pale. Contracture of arms developed. A year later the child was seen and found not to have improved. This case was supposed to have sustained a cerebral birth-injury causing several foci of hemorrhages.

M. B.

A CASE OF PSEUDOPARALYTIC PTOSIS FOLLOWING AN ACCIDENT.—BETTREMIEX (*La Clinique Ophthalmologique*, May 10, 1907). The author saw this case in revision a month after the accident, the matter pertaining to the injury having been settled in July, 1906, by a pension corresponding with a reduction of 8 per cent. in professional capacity.

The patient, a carpenter, 22 years old, was injured March 10, 1906, by the falling of a heavy piece of wood which produced a right fronto-parietal contusion with cerebral concussion. The injury did not seem to produce any serious consequence, and at the end of March the man returned to work. He complained in April that the vision of right eye had diminished and the question was raised as to whether there was an optic-nerve lesion. Bettermieux saw the case May 3, and found a complete closure of the right eye,

with lowering of the corresponding eyebrow, which eliminated the diagnosis of a veritable ptosis. There was no appreciable lesion discovered by ophthalmoscopic examination. The pupillary reflex was normal; patient complained of a pronounced amblyopia of right eye. From several proofs of simulation, Bettremieux believed that the amblyopia was feigned, and two confrères confirmed that opinion, which was based on the fact of the association in the same subject of hystero-traumatic blepharospasm and stimulated amblyopia. Such a combination would be an exception to the rule of Parinaud, that amblyopia or amaurosis does not occur with blepharospasm. There was anesthesia of the pharynx and nearly complete right hemianesthesia with a few zones of intermittent sensibility; the knee tendon reflex was normal; the right plantar reflex was suppressed. The visual acuity of the left eye was normal; the limits of the field for this eye were approximately the same for all directions, 30° for white, 20° for red and green and 10° for blue. Medical treatment and electrization gave no result. Operation for ptosis was refused. Bettremieux believes it would be more just, in disability resulting from injury, to insist on the elapse of a longer period before deciding as to the amount of indemnity.

B. E. F.

TWO CASES OF CONTRALATERAL VISUAL DISTURBANCES AFTER OPERATION ON SPINA OF THE NASAL SEPTUM.—LAAS, DR., Frankfurt a. O. (*Zeitschr. fuer Augenheilkunde*, xviii, August, 1907, p. 142). A man, aged 33, complained of flickering and impairment of vision of his right eye fifteen minutes after a spina at the left side of the nasal septum had been removed with the chisel. The next day the pupil was larger than the left, showed sluggish, direct, prompt, consensual reactions. Almost the whole upper half of the visual field was lacking, with the lower half only motion of hand was seen. After a few weeks V. = 5/xv, the optic disc was paler than left, after two months atrophic, except the upper nasal portion. Hemianopic reaction of the pupil upon illumination of the lower half of the retina. The left eye was perfectly normal.

Laas assumes as the cause of the partial optic atrophy a laceration of the optic nerve by a fracture of the wall of the right optic canal, caused and propagated by the chiseling of the spina on the left side of septum, on account of special anatomic conditions, to which Onodi first called attention. Laas thinks either the left sphenoidal sinus and the last ethmoidal cell formed the wall of the right optic canal, or the right sphenoidal sinus or last ethmoidal cell formed the wall of the right optic canal and extended beyond

the median line and perhaps between the lamellæ of the perpendicular lamina. In both cases the chiseling of the spina, reaching very far backwards and upwards, could produce a fracture of the wall of the neighboring accessory cavity and a fissure up to the wall of the right optic canal.

According to the anatomo-pathological researches of Hoelder, who found in 53 out of 86 fractures of the cranial base fractures of the walls of the optic canal, the visual disturbances after injuries of the skull, either total amaurosis or defects of the visual field, as in this case, and the ophthalmoscopic conditions are due to fractures or fissures of the optic canal.

A similar explanation is given in the second case observed by Professor Kuttner. After removal of an exostosis from the posterior portion of the left side of the nasal septum with the saw, driven by an electromotor, the patient could not see with his left eye, had fever and was drowsy. The fundus was normal in both eyes, but the left eye completely blind, the right showed temporal hemianopia. An injury of the anterior angle of the chiasm was surmised by a fracture propagated from the wound to the optic canal.

From these observations Laas advocates discretion in operating on deviations of the septum far backwards and upwards. C. Z.

WOUNDS OF THE OCULAR ADNEXA BY BROKEN SPECTACLE LENSES.—NANCE, W. O., Chicago (*Jour. Ophthal. and Oto-Laryng.*, August, 1907, i, 167), refers to the extreme infrequency of injuries to the eyeball caused by broken lenses. He refers to seven cases of injuries to the ocular appendages that have come under his observation, in which the wound was caused by broken lenses. He believes that injuries to the eyeball by broken lenses are extremely rare; that injuries to the ocular appendages are more common; that they occur more frequently among wearers of spectacles than nose glasses; that the injury is usually due to breaking of rimless glasses, and that such injuries are extremely rare in patients under the age of 14 years. W. R. M.

INSTRUMENTS AND METHODS OF EXAMINATION.

AN IMPROVED FORM OF ARTIFICIAL EYE. GROSSMANN, KARL. Liverpool (*The British Med. Jour.*, Nov. 2, 1907). The writer has recognized the desirability of rectifying the one great shortcoming which exists in a large number of artificial eyes—that is, the sunken appearance of the eye itself, which generally gives the secret away at the first glance. The Snellen eye is a considerable step in the right direction; it practically eliminates the irritation caused

by the sharp edge of the old glass eye, but it does not remedy the sunken appearance of the upper lid.

The writer claims to have removed the defect in question by artificial eyes which have protrusions at the upper margin, placed where the lid sinks in most and adapted to each individual case. When required, the back wall is made to bulge out. C. H. M.

THE INTERIMPROTHESE.—GALLEMAERTS (*Tydschr. v. Gen.*, Oct. 13, 1906) describes a glass eye, made after Snellen's reform eye, but with a hole in the middle in the place of the pseudocornea. This is placed in the conjunctival sac very soon after enucleation; there is no retention of secretion. He puts it in the first or second day after operation, some put it in directly after the operation and connect it with the conjunctiva with a few threads. It prevents loss of elasticity of the eyelids, is not disagreeable, the patient can appear sooner publicly. It is made by Mueller in Wiesbaden.

E. E. B.

GOLD SPHERE AFTER ENUCLEATION.—PRINCE, A. E., Springfield, Ill. (*Jour. Ophthal. and Oto-Laryng.*, September, 1907), advocates the implantation of a hollow gold sphere into Tenon's capsule after enucleation. The author states that his results have been so good that he has discontinued the operation of evisceration, except in cases of panophthalmitis. The article is illustrated to show the good cosmetic results obtained.

W. R. M.

A NEW INSTRUMENT FOR PARTIAL TENOTOMIES.—LEWIS, G. GRIFFIN, Syracuse, N. Y. (*Ann. Ophthal.*, April, 1907). A pair of scissors has been devised which is extended to a complete curve on the flat. The object of these scissors is to remove from the muscles a crescent-shaped piece.

M. B.

FORM AND MANIPULATION OF INSTRUMENTS USED IN OPHTHALMIC SURGERY.—LANDOLT, E., Paris (*British Med. Jour.*, Nov. 2, 1907). The writer asserts that many of the instruments that we employ still retain the form and design given to them by the general surgeon, and that, therefore, they are less well adapted to our purposes than might well be the case.

He advances the following postulates: (a) To attain the requisite delicacy of handling, we must bring our finger tips as close as possible to the essential portion of the instrument, because the tips possess the most accurate tactile sensation. (b) The requisite movement should be obtained from the finger-joints and not from the wrist or arm. (c) We should use the minimum of

muscular effort in working with our instruments; hence we should not use, for example, a heavy or slippery handle, or a forceps with a too resistant spring. (*d*) Resting the little finger on the orbital margin of the patient gives a support to the hand which will make the movements of the fingers steadier and more precise, ensure the operator's hand moving with the patient's head, and discount any sudden movement of the patient.

He then considers how far the ocular instruments furnished by manufacturers fulfill these postulates. In all surgical instruments we can distinguish three portions—(*a*) the handle, (*b*) the active extremity, (*c*) the intervening part called the shaft.

Taking up first the question of knives, he recommends scalpels in which the blade is separated from the handle by a very short shaft and is much shorter than those usually supplied; these bring the fingers near that part which we are incising and with them it is possible to take a point of support on the patient's face, thus admitting of greater precision. The blades of cataract knives are generally well made and of good dimensions. With iridectomy knives, however, he finds the same fault as with scalpels—the shaft is too long—20 mm. would be sufficient, so that we could apply the little finger to the orbital margin and still hold the instrument by the handle. He uses an iridectomy knife of curved shape in which the movements of the instrument take place in its curved axis, and thus more force and accuracy are obtained. The edges of the blade, instead of forming, as usual, two straight lines joining at a more or less wide angle, have towards the apex a slight incurvation. The point of the knife forms thus a much smaller angle than the rest of the blade. This curvilinear shape of the blade answers its purpose much better than the usual form. The latter would be right if the body which we attack had throughout the same resistance, but when we do an iridectomy we find first a strong resistance at the corneal line; the point of our instrument, having passed through this part, penetrates into the aqueous chamber, which offers no resistance. It is, therefore, essential that the blade of the keratome should be more pointed as long as it passes through cornea and sclera. The point having passed through these tissues, the rest of the blade follows easily, whatever its breadth may be. He advises curtailing the shaft of scoops, cystitomes and spatulæ and of all instruments introduced into the globe.

Regarding the handles of instruments, he considers iron an ideal material, of suitable weight and proper surface, even though it does crack after repeated sterilization; if the blade be fastened with a screw instead of cement, it will not loosen: the only ma-

material which approaches ivory in desirability is aluminum. There is nothing to be said against the form of handles now supplied by instrument-makers. As for the length of handles he has never found one too short, but often too long.

Speaking of forceps, he says that the spring is usually too stiff and the blades too weak, so that the seized tissues often slip away; in most forceps the extremities of the blades are too long—the portion below the grip should be shortened 5 mm. The forceps are rarely applied perpendicularly to the object seized, but generally at an angle of 45° ; hence the teeth should be placed obliquely to the blades and perpendicular to the surface to be seized.

Concerning scissors, he gives directions how these should be held: "The end of the last phalanges of the thumb and ring finger are delicately inserted in the rings of the scissors, so that the simple movement of those two fingers will open or close the blades. The index finger, which, of course, should be curved, is applied to the crossing. The extremity of the middle finger is applied, on the opposite side, to the ring and corresponding handle. Thus the scissors are steadied by the thumb and ring finger on the sides, by the index finger above, and by the middle finger underneath." This insures working with lightness and precision, and the scissors become a sensitive probe. Very often the handles of scissors are too long and generally they are unnecessarily pointed and the handles too delicate. The blades should be thin, but the handle should be strong and solid.

C. H. M.

THE ENTOPTIC METHOD AS A METHOD OF DIAGNOSIS.—FORTIN (*Arch. d'Ophthalmologie*, June, 1907). On account of the extremely minute dimensions of the fovea, the methods of examination at our disposal for studying this most important region are not satisfactory. The ordinary perimeters are practically useless for examination of the central vision, since the fixation mires of many of them are large enough to cover not only the projection of the fovea, but that of the entire macula. The fovea corresponds to a visual angle of 1° and the macular to one of 5° , which angles on a perimeter of 30 cm. radius mark linear dimensions of .5 cm. and 2.5 cm. The ophthalmoscope also can scarcely analyze so small a space as the fovea, which occupies only an ellipse of from 200 to 400 microns. It is insufficient, too, for the examination of four dust-like opacities of the vitreous.

Fortin has, therefore, resorted to the entoptic method in an attempt to make the eye examine its own macula. This method is, of course, applicable only in the cases of intelligent patients.

The principle of the method is as follows: Supposing that we have before us a wide homogeneous surface without any line or shadow to form an image on our retina. If the eye is illuminated with a monochromatic light, it will project on this surface, in ascertained conditions, certain details of its minute structure. Purkinje, Muller and others have observed in their own eyes not only the larger vessels, but the capillaries and even the blood globules circulating in them, but those who attempt to reproduce these experiments find that a certain education is necessary, as "one must not expect to see the details in a first or second or third attempt." Once seen, some of these details are likely to persist as a more or less permanent annoyance afterwards.

The condition usually sought by observers for the entoptic examination of the blood is to have before them a blue glass.

For the entoptic examination of the cornea and lens the author refers to the papers of Darier (*Annales d'Oculistique*, 1895 Tome ii) and Tscherning (*optique physiologique*).

To observe the corpuscles of the vitreous it is sufficient to place the eye in the course of a bundle of luminous rays concentrated by a lens or to look upon large ground glass surface illuminated by transparence, while holding before the eye an opaque disc with a stencopaic hole. One distinguishes filaments and granulations descending slowly in front of or at the side of the point of fixation. Moving the eye quickly sets in motion all the particles which are held in suspension, and, as they seem always to descend, their real movement must be upwards, which shows that their density is less than that of the vitreous. These spots in the normal condition are always mobile. If they remain fixed when the eye is moved, they are pathological. The physiological elements of the vitreous body appear in four forms: filaments, strings of pearls, brilliant discs and "glomerules."

The glomerules were at first supposed to be pathological "*muscæ volitantes*," but are normal productions. The author maintains that there are *muscæ volitantes* absolutely physiological. These glomerules represent filaments twisted upon themselves and may have a rôle in the formation of the vitreous. As we meet with intermediary forms between glomerules, filaments, chaplets and granules, these different forms may be evolved from each other. *Muscæ volitantes* are not apparent to myopes and neurasthenics because the former naturally and the latter from fatigue of the ciliary muscle have difficulty in obtaining sharp retinal images of external objects, a condition favorable for the perception of objects within the eye.

Microscopists often see these vitreous elements in their examinations because their lashes form a series of stereopic slits.

Examination of the larger vessels by the experiment of Purkinje is well known.

As to the examination of the fovea and macular regions, Nuel (*Archives d'Biologie*, 1883), by means of a stenopaic hole or slit moved before the eye, which was directed to the sky or to a surface covered with snow, observed the mosaic formations of his own fovea and not only counted the cones which it included, but distinguished the structure of one of them.

Fortin believes that the best results are obtained with the purest blue light and uses tubes with the vapor of mercury. When these tubes are covered with two thicknesses of blue glass the light passing through them is purely monochromatic. He receives the light from two of these tubes placed side by side upon a lens 12 cm. in diameter enclosed in an opaque frame. The eye is placed near the lens in such a way that the whole field appears uniformly illuminated, and an opaque screen with a stenopaic hole is shaken in front of the eye and close to it. Immediately the fine structure of the fovea and that of the capillaries of the macula are perceived. The whole resembles a delicate histologic preparation colored with methylene blue. The texture of the fovea is defined in deep blue, almost black, on a clear blue base. Soon it fades and the eye must be given a few minutes' rest. The fovea is seen surrounding the point of fixation and has the appearance of being formed of cells like a honeycomb. It is composed of the multitude of little circles described by Nuel.

It is an interesting fact that entoptically the eye discerns the structure of the cone, seeing it surrounded by a dense sheath, and the author agrees with Nuel that the cone can not be the ultimate element of visual perception. He claims to have succeeded by this method in detecting minute lesions in the fovea not exceeding 20 or 30 microns in extent.

In the examination of the retinal circulation, Fortin uses the mercury vapor tubes and blue glasses without the stenopaic disc. In the visual field fine curved tubes are seen, very luminous and always in the same places. These are the capillaries. In their caliber little discs are hurried along with great rapidity and are blood globules. In the foveal mosaic no vessels are seen.

However fascinating these experiments may be to the physiologist, a method of examination that requires education even in the expert makes an excessive demand upon the intelligence of the

patient, and we hardly hope to see it come into general clinical use.

G. C. H.

NEW IMPORTANT DIAGNOSTIC RESULTS OF TRANSILLUMINATION OF THE EYES WITH SACHS' LAMP.—VUELLER, H. AUBERT (*Zeitschr. f. ophth. Augenheilkunde*, xviii, September, 1907, p. 2151), shows how valuable the transillumination is for the detection of lack of retinal pigment of the iris, which cannot be made visible by the ophthalmoscope or focal illumination, or of the thickness of pseudomembranes in iridocyclitis, to ascertain the best place for an artificial pupil. In injuries the lamp may show the course a foreign body has taken in an eye, in iridodialysis the extent of the affection. In secondary cataract the different thickness of various places is indicated by the brightness of the strata. The same was observed in persisting pupillary membrane. The secondary character of the glaucoma was demonstrated in a case by gaps in the posterior pigment layer of the iris. Atropin being of no effect, it was clear that a severe iritis had led to total adherence of iris and lens capsule. In total leucoma the conditions of the pupil may be elucidated by transillumination. The various conditions are well illustrated on a colored plate.

C. Z.

ON THE DISCOVERY OF INTRAOCULAR BODIES BY ROENTGEN RAYS.—HAMBURGER, C., Berlin (*Klin. Monatsblätter f. ophth. Augenheilkunde*, xlv, Mai-Juni, 1907, p. 511). Although the sideroscope is primarily preferable to the Roentgen rays, it is not reliable in some cases of very small pieces of steel, not to speak of pieces of copper and lead, by interference of electric cars or cables in large industrial centers and cities. The usual method of calculating the seat of foreign body from the differences of its position with regard to a certain mark in the various Roentgen pictures was more or less troublesome.

Therefore, Hamburger devised a new very simple method, based on the principle of elementary optics, that the shadow of an object is the sharper the nearer the receiving screen is to the object and the less distinct the farther it is from it. In the first case the umbra is obtained, in the second the penumbra.

Hamburger ascertained that this difference of the outlines of shadows exists also in Roentgen rays. In the principle lies also the limitation of the method, since the plate must be approached to the eye as much as possible, to get a photograph, from the temporal and nasal sides, and this is possible only in foreign bodies in the anterior half of the eye. These are, on account of the more

favorable chances for a foreign body to land in the anterior portion of the eye, probably more frequent. For illustration four cases are reported.

The exposures are done in the following manner: A monacle plate, 7 cm. long, 3 to 4 cm. high, is held by a flexible metallic clasp on a headband vertically to the frontal plate and closely to the eye, adjusted as far back as possible between the eyeball and orbital walls at the nose and temple, not outside the temple. If the patient should slightly move, the plate, being fastened to the head, moves in the same sense. With the nasal monacle the exposure lasts six to eight seconds, with the temporal two to three times longer, because the rays must pass through the whole skull.

The reliability of Hamburger's method was first tested on enucleated eyes, placed into the orbits of skeletons, and finally on cadavers, and was corroborated on two patients of Professor Hirschberg. The nasal exposure in one revealed the foreign body distinct, the temporal ill defined, corresponding to its nasal seat. In the second case a man had been shot in the face. Some shots were lodged in the temporal portion of the orbit between eyeball and temple. The nasal exposures were indistinct, the temporal ones clearly and sharply defined.

The procedure is so simple that it ought to be given a trial in every case in which the nature of the foreign body or other conditions exclude sideroscopy. If neither of both monacles shows a shadow, the foreign body is, if at all in the globe, in the posterior segment and the method not applicable, so that one of the numerous other methods must be resorted to. If the plates show, in repeated exposures, no marked differences in their outlines, the foreign body lies in, or near to, the median line. If there is a decided difference of contours of the skiagram, with or without loupe, the two monacles directly indicate whether: 1. The foreign body lies in front or back. 2. Up or down. 3. Nasal or temporal. The quadrant is thus identified.

C. Z.

IRIS.

CONCERNING THE SO-CALLED CLUMP CELLS OF THE IRIS.—ELSCHNIG and LAUBER, Wien (*Graefe's Arch.*, lxvi, 3, May, 1907), conclude that the clump cells found scattered over the iris surface correspond in their histology and in their clinical relations to the pigment cells of the retinal layer of the iris, but show, on the contrary, no affinity with the elements of the iris stroma. It may be affirmed that all of these cells have one and the same origin and are to be considered as derivatives of the retinal portions of the iris.

The wandering pigmented epithelial cells found in the iris stroma in pathologic states stand in the same relation to the pigment of the iris as does the pigment epithelium of the retina. It is known that in the various disease processes of the chorioid, retinochorioiditis, anomalies of the circulation, etc., new-formed pigment epithelium penetrates the retinal tissue and may spread out cord-like along the retinal vessels. An analogous condition has been found in the iris by Fuchs. In cases of primary or secondary iritis and also in many cases of glaucoma it is easily demonstrable that pigment epithelial cells of a quite irregular form penetrate the iris stroma from the epithelial layer and particularly along the vessels, often enclosed in the connective tissue sheath of the latter. Elschnig himself has repeatedly seen clinically the development of nevus-like pigment areas in the iris stroma which were doubtless of the same new formations, e. g., the immigration of cells similar to the "clump cell."

W. Z.

SOME FEW RANDOM THOUGHTS ON THE PUPIL IN HEALTH AND DISEASE.—ELLIS, A. N., Maysville, Ky. (*The Lancet-Clinic*, Oct. 12, 1907). After mentioning the innervation of the sphincter pupillæ, the causes of dilatation and contraction and inequality of the pupil are discussed, the last being always important and pathognomonic in paralysis of the insane, in support of which statistics are quoted. The writer says that in uremic poisoning the pupils are generally contracted, also the same is seen in low, long-continued fevers, but in enteric fever dilatation is found. He emphasizes the point that in cerebral apoplexy the pupil is at first contracted, while in embolism it is unaffected. After referring to the eye symptom in diseases of the spinal cord, particularly progressive locomotor ataxia, the writer cites an imaginary case of a patient found in an unconscious condition, excludes and admits certain diagnostic factors found in different pathologic conditions to which this state may be due, thus illustrating the method of arriving at a diagnosis.

M. D. S.

IRITIS IN GENERAL DISEASE.—CHANCE, BURTON, Philadelphia (*Therapeutic Gazette*, August, 1907), assumes that all cases of iritis and iridocyclitis, not dependent upon traumatism, have as their causative basis a general toxemia. In hereditary syphilis iritis is seen during the first two years of life, at about the age of 6, and occasionally in late adolescence. In acquired syphilis it develops as a plastic inflammation in the early secondaries or as a late tertiary manifestation. In rheumatism it is rarely present in the

acute form of arthritis, but is commoner to the chronic rheumatic habit. It is doubtful if iritis develops in true gout, but is due rather to the conditions spoken of as the gouty diathesis, lithemia, and uric acid diathesis, etc. Intestinal autointoxications are also causes of iritis. Iritis in tuberculosis is less rare than it was once thought to be. It has been seen in typhoid fever, smallpox and in epidemic cerebrospinal meningitis, and is usually manifested as the serous variety. It is seen in malaria and in all forms of meningitis, whooping-cough, pyemia, infection from the mouth, diabetes and albuminuria.

M. B.

ETIOLOGY OF IRITIS.—ZENTMAYER, W. M., Philadelphia (*Therap. Gazette*, August, 1907), assigns as the causes of iritis, syphilis, rheumatism, gout, tuberculosis, gonorrhea, diabetes, nephritis, malaria, some infectious fevers, anemia, autointoxication, sinusitis, trauma, sympathetic inflammation, adolescence and senility. He holds syphilis responsible for 70 per cent. and rheumatism for 15 per cent.

M. B.

TREATMENT OF IRITIS.—ZIEGLER, S. LEWIS, Philadelphia (*Therapeutic Gazette*, August, 1907). Local measures, atropin, moist or dry heat, dionin, leeching, galvanism with positive pole to eye, hyoscin hydrobromate to relieve pain and protect eye from the light. Systemic treatment: Calomel, $\frac{1}{4}$ gr. four times daily for four days. Inunctions when syphilitic, also iodid of potassium. When rheumatic, large doses of sodium salicylate or aspirin. Five to ten minimum does of turpentine will act as a stimulant when circulation is sluggish. Diaphoresis will increase lymphatic action. Morphia may be demanded for relief of pain. Koch's "old tuberculin" in tubercular iritis. Surgical measures consist of iridectomy.

M. B.

A NEW PROCEDURE FOR TREATING A PROLAPSE OF THE IRIS COMPLICATING PERFORATING WOUNDS OF THE CORNEA.—HECKEL, E. B., Pittsburg (*Penna. Med. Jour.*, August, 1907, x, 866), uses a solution of eserine sulphate, one grain to the ounce, before removing a prolapsed iris. After cutting the iris tissue close to the cornea, he passes a small horn spatula into the corneal wound, permitting the iris, aided by the myotic action of the eserine, to withdraw into the anterior chamber. After twenty-four to forty-eight hours he uses atropin. He adopted this procedure as a result of his observations that mydriatics will not dilate a pupil when there is an open or leaking anterior chamber, and thus draw the iris away from the wound, while myotics will act with an open corneal wound.

W. R. M.

LACRIMAL APPARATUS.

A CASE OF PERFORATION OF THE CARUNCLE IN DACRIOBLENNORRHEA.—BOLEY, HANOVER (*Woch. f. Therap. u. Hyg. des Auges*, April 25, 1907). The patient was first seen on the fifth day of an acute blennorrhea of the sac. The region of the plica and of the caruncle was greatly swollen and reddened. Thick pus was exuding from both puncta and at the same time a slight amount from the depths of the region of the caruncle. Examination showed in the latter position a crater-shaped ulcer with thickened, bleeding margin. A few days later, after the inflammation had subsided, pressure over the sac caused the pus to exude almost entirely through the ulcer. Syringing through the lower canaliculus caused the fluid to flow from the ulcer. Healing without sequelæ took place. W. Z.

SURGERY OF THE LACRIMAL APPARATUS.—ADDARIO, C., Palermo (*Ann. Di Ottalmologia*, No. 5, 1907). 1. Exploratory incision and treatment of dacriocystitis by an open-air method. Curative means in a diseased process, to be efficient, should be proportionate to the pathologic alteration which the organ or tissue presents. Since 1902, in undertaking the treatment of dacriocystitis of long duration, I have examined by the open method the condition of the mucous membrane. To this end I practice an incision in the anterior wall of the sac in its entire length. After stopping hemorrhage, the condition of the membrane is inspected. In some cases I have found the membrane rosy and smooth; in others of a rusty red color, and in still others of a fungous aspect with one or more polypoid formations. On palpation with the sound the mucous membrane is in some cases hard, in others soft and bleeding. In obstinate dacriocystitis with ectasia of the anterior wall of the sac, it is well to resort to exploratory incision, but not at first to excise the entire sac. In cases without ectasia but with circumscribed narrowing, I practice scraping of the mucous membrane of the sac when it is red or soft. 2. The treatment of congenital dacriocystitis with a new contribution to its etiology. Cases of congenital dacriocystitis merit a special management on the part of the surgeon which should be regulated according to the different changes which present. In the absence of inflammatory signs, I proceed with digital pressure to force the contents of the ectasic sac towards the lower opening of the canal. In a few such cases there appears a mucopurulent discharge in the naris. The repetition of this treatment twice daily for a short time results in cure. In cases where the sac is somewhat swollen and painful and not

emptied by digital pressure either through the sac or canaliculus. I have used moist heat to relieve the inflammatory symptoms. Usually after two or three days one can empty the sac by pressure from the punctum. If an obstruction exists in the canal, I do not probe through the punctum. With the point of a narrow lid knife, I make a row of buttonholes, each about 2 to 3 mm., in the anterior wall of the sac. Then I make an exploratory sounding to get an idea of the obstruction. In some cases the sound comes in contact with a cul-de-sac and I have the sensation as if I were pushing a stick against the bottom of a bag. Then I push the sound and soon enter the nasal cavity. I irrigate, apply a piece of gauze and bandage. For four to five days I repeat this treatment with a No. 6 Bowman sound. Cure is usually prompt. In cases in which the inflammation has become phlegmonous, I practice at once incision of the anterior wall of the sac and as soon as practicable pass the sound as above.

In congenital dacriocystitis of the new-born or incomplete canalization of the embryonic, epithelial cord or congenital atresia through defective development, I have seen another congenital defect not recorded by others—an enormous enlargement of the nasal canal and its inferior orifice, in a child, 1 year old. I practiced incision of the anterior wall of the sac for dacriocystitis. After the escape of pus I was able to assure myself that a No. 6 sound passed easily through the canal and into the nose. The patient recovered rapidly following antiseptic irrigation. In three other cases the canal was found enlarged.

R. H. J.

CONGENITAL DACRIOCYSTITIS.—HIRSCH, G., Halberstadt. Abridged translation from the German edition, August, 1902, by Dr. M. L. Foster (*Arch. Ophthalm.*, September, 1907, xxxvi, 661). The author reports five cases of congenital dacriocystitis. In the three cases in which pus was examined Frankel's pneumococcus was present. In all cases the mother had a leucorrhea. Hirsch states that spontaneous recovery may be expected without surgical intervention or catheterization.

W. R. M.

THE LACRIMAL GLAND IN MAN AND MAMMALS.—DUBREIL (*Revue Generale d'Ophthalmologie*, Aug. 31, 1907). This paper is one in which only a full translation would be satisfactory, its length being too great for that. An abstract could not do it justice.

B. E. F.

CYST OF THE LACRIMAL GLAND.—DOR (*Revue Generale d'Ophthalmologie*, Aug. 31, 1907). The case with the specimens was

presented at the Society of Ophthalmology at Lyons. There had been swelling under the eyebrow and exophthalmus. The neoplasm, which was probably congenital, was not noticed until the child was 2 months old.

B. E. F.

LIDS.

DISEASES OF THE BORDERS OF THE LIDS KNOWN UNDER THE TERM BLEPHARITIS CILIARIS.—CHERNO, FRANZ, DORMACH, Switzerland (*Zeitschrift fuer Augenheilkunde*, xviii, July, 1907, p. 1), studied these affections on the clinical material of Dr. Hegg of Bern, whose views he reports with utilization of the incident literature, especially of the recent elaborate essays of Winselmann and Herzog. According to Unna and Maehly, there are two kinds of cilia, viz., the button cilia (*Knopfhaare*) and club cilia (*Kolbenhaare*). The button cilia are converted into club cilia in a period of one to two months. A distinction must be made between youthful button hairs and belated ones, whose normal development is arrested by diseases of the follicles. The various forms of blepharitis are: blepharitis ciliaris simplex, b. c. squamosa, b. sycomatosa simplex, b. sycomatosa ulcerosa, b. eczematosa, b. eczematosa cum sycosi, which are characterized and described in detail.

Cherno summarizes in the following theses: 1. The most frequent kind of blepharitis ciliaris is sycomatous. 2. The infection generally occurs at the moment of the changes of cilia on the youthful button cilia. 3. A diseased follicle loses the faculty of eliminating the cilium. 4. With very few exceptions the diseased cilia are button cilia, called by Hegg belated button cilia. 5. The treatment consists in systematic and repeated epilation. 6. Besides the usual sycomatous blepharitis, an eczematous form exists independent of the former.

C. Z.

MATERIA MEDICA AND THERAPEUTICS.

DIONIN.—KAYSER (*Woch. f. Therap. u. Hyg. des Aug.*, May 2, 1907), relates his experience with this drug in the treatment of corneal opacities, injuries, operations and ulcerative keratitis. He gives the progress of 20 cases of corneal opacities and concludes that dionin holds a place in the front ranks of ocular therapeutics. He believes that it should be used in such strength as will produce redness and chemosis and a few minutes of severe burning. He uses it in solution, in substance and mixed with yellow salve.

W. Z.

COMPARATIVE INVESTIGATIONS ON THE ACTION OF COCAIN AND NOVOCAIN.—SCHLUTER, H. (From the eye clinic of Prof. H.

Sattler in the University of Leipzig. *Klinische Monatsblætter fuer Augenheilkunde*, xlv, August-September, 1907, p. 198), made comparative tests of the anesthetic effects of solutions of different concentrations of cocain and novocain on the sensibility of the cornea, according to von Frey's method with hairs, which is described in detail. The results are graphically represented in curves.

The anesthetic effect of instillations of weak solutions of novocain is not as rapid, as intense and as lasting as that of cocain. For minor operations on the cornea and conjunctiva a 10 per cent. solution is recommended. The addition of suprarenin prolongs the time of anesthesia. A slight mydriasis could be observed which soon disappeared.

For infiltration anesthesia 1 to 2 per cent. solutions of novocain with adrenalin proved equally effectual as cocain in advancements, exenterations and enucleations.

Eusemin, however, a mixture of 0.0075 cocain and 0.00005 adrenalin, is a cheaper anesthetic for subcutaneous and subconjunctival applications; $\frac{1}{2}$ c.cm. suffices for anesthesia in advancement, 1 to 2 c.cm. in extirpation of the lacrimal sac or enucleation, whereas 2 to 3 c.cm. novocain are required for the same purposes, which, on account of the greater quantity of the infiltration fluid, interferes with the view over the field of operation.

Novocain is less poisonous, scarcely dilates the pupil and does not paralyze accommodation. For infiltration anesthesia a 1 per cent. solution is sufficient.

C. Z.

ON CHIROSOTER.—KLAPP, PROFESSOR, and DOENITZ, Assistant, Berlin. (From the surgical clinic of Prof. A. Bier in the University of Berlin. *Deutsche Medizinische Wochenschrift*, 1907, No. 34, p. 1366), proved by bacteriologic investigations that the greater portion of germs, remaining after disinfection of the skin, may in a very simple manner be excluded by spraying "chirosoter," a solution of wax in tetrachlorecarbon (manufactured by Krewel, Cologne) on the hands and the field of operation. The authors believe that it is very useful in fresh injuries which can not be regularly disinfected, especially in emergencies and in war, where there is lack of water.

C. Z.

TREATMENT OF KERATITIS PARENCHYMATOSA WITH IODIN OIL.—TERLINCK (*Tydschr. v. Gen.*, Oct. 13, 1906), mentions that the iodine combinations act on the body through the iodine, which becomes free, and combines with albuminous bodies. The slower the splitting off the longer the action of the iodine. Combinations

with organic substances are lately much sought after, as the iodine comes very slowly free from these. Such a combination is the combination of iodine with fats, iodine oil, which is known in two forms: the iodipin (Merck), which contains 25 per cent. iodine, and the lipiodol (Lafay), with 40 per cent. iodine. This last one is injected daily subcutaneously in the back during twenty days, 5 grams (4 cm.). The injections are not very painful. Iodine is still found in the urine after two to three months. Once the injections were continued during 30 days, which produced albuminuria lasting many weeks. One must, therefore, be careful and the urine should be examined constantly. Terlinck was impressed favorably with 20 patients, 18 of whom were severe cases (with 19 the illness was due to heredosyphilis). The corneal opacities cleared quicker than otherwise, while good vision was recovered. Two patients had only one eye affected, and here the other remained healthy. He also found an increase in the number of leucocytes and the hemoglobin.

E. E. B.

TREATMENT OF FUNDUS DISEASES.—STOCKE (*Tydschr. v. Genee*, Oct. 13, 1906), considers intensive mercurial treatment beneficial for all internal diseases of the eye, neuritis, chorioiditis, retinitis, whatever the character of the disease may be. The treatment must consist in intramuscular injections of soluble combinations (hydrargyri-iodine and cyanate); in some cases, as myopic central chorioiditis, even intravenous injections. The dose must be high and the treatment must be rapid and strong. Mouth and urine must be looked after. Old age and nephritis are contraindications. As support, subconjunctival injections of mercurial combinations are to be recommended, which are without pain on addition of acon. Good results are obtained in some hopeless cases.

E. E. B.

THE CALMETTE SERUM REACTION IN OPHTHALMOLOGY.—STEPHENSON, SYDNEY, London (*British Med. Jour.*, Oct. 19, 1907). The writer remarks that our ordinary methods of clinical examination not infrequently leave us in doubt as to whether tuberculosis exists, especially when the foci exist in the bronchial or mesenteric glands; the injection of tuberculin is undoubtedly of service, but its use requires hospital treatment and consequently it is not applicable to every-day diagnostic use. The new method of diagnosing tubercle announced by Dr. A. Calmette is, on the other hand, exceedingly simple: "His plan was to place a drop of a 1 per cent. watery solution of dried tuberculin in the eye of the

patient. In the case of healthy subjects the result of the application was *nil*. On the other hand, the tuberculous subject showed a local reaction, now widely known as the ophthalmo reaction of Calmette. From the third hour onwards the eye to which the tuberculin had been applied became reddened, and in the course of several hours showed all the appearances of a more or less pronounced attack of acute mucopurulent inflammation of the conjunctiva. The maximum reaction was seen within six or seven hours after the application of the tuberculin. All traces of inflammation had disappeared within two or three days. The plan is free from danger and causes the patient scarcely any discomfort."

The writer calls attention to the fact that there are several affections of the eye, notably chronic iridocyclitis, scleritis and some forms of chorioiditis, the tuberculous origin of which is proclaimed by some and decried by others. He gives a brief summary of the ophthalmic experiences with Calmette's serum by various observers and then briefly describes his own results in upward of thirty patients: The ophthalmo reaction was obtained in all cases of phlyctenular conjunctivitis and keratitis (6); in all instances of chorioiditis (3); in three out of eight patients with interstitial keratitis—the other five manifesting obvious stigmata of inherited syphilis; in one out of three examples of episcleritis.

"If there be one class of cases more than another in which tuberculosis is believed to play a prominent rôle, it is in insidious and recurrent iridocyclitis in young adults. According to Stoeke's recent investigations, of 59 patients suffering from chronic iridocyclitis no fewer than 61 per cent. showed a general reaction after the injection of Koch's older tuberculin, t. v. I have submitted two patients to the tuberculin test and obtained the ophthalmo reaction in both."

C. H. M.

THE SERUM TREATMENT OF EXOPHTHALMIC GOITER.—ALEXANDER, HARRIET C. B. (*The American Practitioner and News*, August, 1907), discusses the subject and reports thirteen cases. Four principal theories of the disease have been advanced: (1) That it is due to disease of the sympathetic nervous system; (2) that the seat of the malady is the medulla oblongata; (3) that it is primarily a disease of the thyroid gland, and (4) that it is a neurosis.

Modern therapeutic measures have been largely based on the "thyroid" theory. The results of partial strumectomy indicate that the successful removal of a portion of the thyroid gland can lead to cure or to definite amelioration of the condition. On the

theory that the thyroid secretion normally neutralizes certain general metabolic poisons in the body. Möbius and others conceived of treating cases of exophthalmic goiter, in which there is presumably an excess of thyroid secretion in the body, by introducing subcutaneously, or by the mouth, the serum of thyroidectomized animals. It was hoped that the non-neutralized general metabolic poisons of such animals would nullify the toxic effect of the excessive thyroid secretion. As to the treatment, experience has shown the great importance of general measures: complete rest for a time, fresh air, careful diet, mild balneotherapy, etc.

The name thyroidectin has been given to a preparation obtained under aseptic precautions from the blood of animals from which the thyroid glands have been removed, and which is exhibited as a reddish-brown powder contained in capsules, usually five grains each. Carefully conducted clinical trials seem to show that thyroidectin can be depended upon to control the characteristic symptoms of exophthalmic goiter. In most cases the patient experiences much relief from the restlessness, tremors, insomnia and other nervous symptoms so frequently present, and a gradual lessening of the frequency of the pulse rate, decrease in the size of the glands, and a diminution of the exophthalmos, with an increase of weight and a much better condition generally. The dose of thyroidectin seems to be one or more capsules after each meal, according to the judgment of the physician and the reaction of the patient.

In nine of the author's thirteen cases the size of the gland was materially reduced, and in every case improvement was observed with respect to one or more of the symptoms.

THE TREATMENT OF OCULAR TUBERCULOSIS, WITH SPECIAL REFERENCE TO THE USE OF TUBERCULIN T. R.—TOROK, ERVIN. New York (*Arch. Ophthalm.*, September, 1907, xxxvi, 625), discusses the various operative measures that have been resorted to for the relief of tuberculosis of the eye and the results that have been obtained by each. He reviews the various forms of conservative treatment that have been advocated and discusses the relative values of the old tuberculin and the tuberculin T. R. as devised by Koch in 1889. He reviews the published reports of Koch, Zimmermann, Hippel and others and gives his own experience in the treatment of 16 cases in the eye clinic of the Royal Hungarian University of Science at Budapest.

For therapeutic purposes tuberculin T. R. was used, beginning the treatment with the injection of 1-1000 mg. and slowly increas-

ing the dose. The majority of the patients were treated by the ambulatory method, with no disadvantage resulting. Of the 16 cases treated, 8 were cured; marked improvement resulted in 4; in 2 cases treatment had no effect. The author believes, as a result of his observations, that tuberculin will cure a great majority of the cases of tuberculosis of the eye. He does not find that tuberculin has any injurious effect upon tuberculosis which may be present in other parts of the body. He calls attention to the following facts: "that in cases where the treatment for some reason or other is interrupted before a cure is attained and then is resumed there is a decided turn for the worse after the first injection, which gives way to rapid improvement after a few more injections have been given," and that "tuberculin is in a certain respect unreliable, because it can not be known when it will cause a general reaction with a high temperature, or when after injection it will cause a local abscess." Clinical histories are given of 16 cases and a bibliography is appended.

W. R. M.

EXPERIENCES WITH KOCH'S TUBERCULIN.—BRÜCKNER, A., Würzburg (*Arch. Ophthalm.*, September, 1907, xxxvi, 647), gives the results of his experiences with old tuberculin and tuberculin T. R. in the Würzburg Eye Clinic. Tuberculin was used for therapeutic purposes in 38 cases, 53 injections being made with old tuberculin and 152 injections with tuberculin T.R. T.V. was injected deeply into the muscles in the interscapular region and no local reaction was observed. T.R. was injected subcutaneously in the forearm and was followed by somewhat severe reaction, lessening in severity as the solutions were made more concentrated. The author believes this reaction was due to the glycerin water used in making the dilution of T.R. Abscess formation was never observed. In 35 cases where tuberculin was used for diagnostic purposes, 17 showed a general reaction. Twelve acute cases of iritis and iridocyclitis were treated and 2 gave a positive general reaction, while in 14 chronic cases of iritis and iridocyclitis a positive reaction was observed in 11. The majority of cases, in which the clinical picture suggested tuberculous disease of the uveal tract, reacted positively to the injection, but Brückner states that this does not prove the cause of the eye disease is tubercular, as the reaction may be due to other tubercular foci in the body, and adds that the only positive proof is a local reaction to the tuberculin in the diseased organ itself. This was observed in 3 cases. Brückner thinks that ocular tuberculosis is usually secondary to other tubercular foci.

W. R. M.

THE EFFECT OF ROENTGEN RAYS ON THE HUMAN EYE.—A. I. MAN (*Wiener Medizinische Presse*, Aug. 4, 1907). The Roentgen rays affect the retina in the same way that ordinary light does, although vision purple is not bleached; neither are there any changes in the pigment, nor shortening of the rods and cones. The author treated a small chorioidal sarcoma with x -rays, with a resulting rapid increase in the size of the neoplasm and detachment of the retina. After six weeks of treatment the eye was enucleated; the tumor showed no signs of degeneration, but there was an optic neuritis and detachment of the retina. J. G.

EXPERIMENTS WITH LOCAL LIGHT THERAPY IN SERPENT ULCER OF THE CORNEA.—HERTEL, E. (From the eye clinic of Prof. A. Wagenmann in the University of Jena. *Klinische Monatsblätter fuer Augenheilkunde*, xlv, August-September, 1907, p. 178). The action of light on the tissues consists, like the thermic or chemical, in an excitation of the plasma, which is greater in rays of short waves than in those of long ones. It acts as stimulus of the functions of the cells (locomotion, contraction, etc.). By rays of greater intensity the function is impeded with final destruction of the cells. This varies in different cells. Bacteria, e. g., succumb much sooner than the tissues of the higher vertebrates, so that for this purpose frequent sittings of shorter durations are indicated. Ferments and toxins may also be checked in their actions by rays of light. Experiments on the eye have shown the therapeutic importance of the indirect, i. e., propagated effects of radiation, as greater injection of the conjunctival and ciliary vessels, edema, decrease of the antitoxic substances of the aqueous, proliferation favorable for cicatrization.

Hertel used as a source a constant arc light generated between electrodes of an alloy of cadmium and zinc, the spectra of which contain the most favorable wave lengths, without deleterious influence upon lens and retina. Forty-seven cases of serpent ulcer were for the first two days treated with disinfection of the conjunctival sac and tear passages, atropin and warm applications, and, as soon as they progressed, with radiation for fifteen minutes three times a day. Twenty-five healed without any other interference, in 3 Saemisch's section had to be resorted to, 13 remained uninfluenced, cauterization and incision being also of no avail.

Comparing this series of ulcers with those of former years, the functional results were better in the cases treated with rays than by

cauterization. Hertel concludes that we are not justified to discard radiation in serpent ulcer. Further trials with improved methods and observations on a larger material will determine the practical value of this method, which from a theoretical standpoint undoubtedly seems indicated. C. Z.

EXPERIMENTS WITH BIER'S PASSIVE CONGESTION METHOD UPON ANIMALS. —WESSELY (*Wiener Medizinische Wochenschrift*, July 6, 1907). Rabbits tolerate congestion of the head very well; after 24 hours edema of the skin of the head is produced, with chemosis of the conjunctiva and exophthalmos. The exophthalmos appears either immediately after the application of the bandage, and is produced by the swelling of the orbital veins, or somewhat later by the serous infiltration of the orbital tissues. At times retrobulbar hemorrhages may also make their appearance.

The eyeball remains intact, and neither the aqueous nor vitreous humor show any increase in the amount of albumen, which proves the non-existence of hyperemia in the iris, or in the ciliary blood vessels. The author did not find stasis of the retinal veins; tension he also found unchanged. It is, therefore, evident that the interior of the eye does not participate in the hyperemia; the blood vessels of the iris and ciliary process, however, participate only in the hyperemia, when the pressure is increased to a degree inapplicable to a human being. He, therefore, does not consider this treatment of any value in affections of the eye. J. G.

THE EFFECT OF PASSIVE HYPEREMIA ON THE NORMAL EYE AND IN CERTAIN AFFECTIONS OF THIS ORGAN.—HOPPE (*Wiener Medizinische Wochenschrift*, July 6, 1907). The author concludes as follows:

1. Artificial passive congestion of the head is not an indifferent procedure; it requires perfect knowledge of technic and the observing of precautionary measures.
2. This method has no effect on the diseased eye.
3. It should not be used in slight affections of the eye.
4. In severe cases, however, where other modes of treatment give no results, this method might be tried.
5. Moderate stasis of several hours' duration extends to the coats of the eyeball and may enter to a slight degree the interior of the eye.
6. The procedure caused in some cases a diminution of the inflammatory pain.
7. The stasis acted favorably in the resorption process in some

cases; in others the effect was doubtful, and in still others there was absolutely no effect apparent.

8. The stasis increases the effects of atropin. J. G.

BIER'S PASSIVE HYPEREMIA IN DISEASES OF THE EYE.—RENNER (*Wiener Medizinische Wochenschrift*, July 6, 1907). The author at first tried this method on himself, and, after describing the symptoms, states that he employed this mode of treatment, with good results, in 5 cases of keratitis parenchymatosa, where the affection had lasted from several months to a year. After two to four weeks of treatment lasting six to twelve hours daily, there was decided improvement. In other cases the results were less satisfactory, but in no case was there any bad effect noticeable.

J. G.

USE OF THE HYOSCIN-MORPHIN-CACTIN TABLETS.—BENSON, JOHN, Colfax, Wash. (*Northwest Medicine*, September, 1907). These tablets, as recommended by Dr. Emory Lanphear of St. Louis and perfected by Dr. W. C. Abbott of Chicago, have many enthusiasts in general surgery and obstetrics and may be worthy of note to the ophthalmologist. "As now used the tablets are composed of hyoscin hydromid, gr. 1/1000, morphia sulphate, gr. 1/4, cactin, gr. 1/67.

"Lanphear's advice as to its use in surgery is to give, for minor operations, one tablet two hours before and a second tablet fifteen or twenty minutes before operating. In the major operations, he recommends one tablet three hours before, a second one hour before and the third when the patient is placed on the operating table, all to be given hypodermically.

"The first tablet given usually puts the patient into a quiet sleep, from which, however, he is easily aroused to answer any necessary questions, only to lapse back into sleep again when left undisturbed.

"Never give atropin after the H-M-C or you will have a most crazy patient."

H. V. W. AND S. G. H.

THE X-RAY AND SOME PERSONAL OBSERVATIONS OF ITS USE IN DISEASES OF THE EYE.—COLEMAN, W. FRANKLIN, Chicago (*The Journal of Ophthalmology and Oto-Laryngology*, July, 1907). The writer discusses the production of the x-ray and reports favorably upon its therapeutic value in several cases, among which are five cases of trachoma, one granular lids with corneal ulcer, two episcleritis, one relapsing keratitis and one orbital cellulitis.

H. V. W. AND S. G. H.

MISCELLANEOUS.

OPPORTUNITIES FOR CLINICAL STUDY IN ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS) AND "FUCHS'" CLINIC, VIENNA.—CROSS, FRANK B., Cincinnati (*The Lancet-Clinic*, June 22, 1907), draws a contrast between the English institution, where there are six surgeons with a like number of assistants, and Fuchs' clinic under the guidance of one assistant. He gives days of attendance and briefly characterizes each of the chief surgeons at Moorfields. There are courses of lectures of six weeks each, three times yearly. Some of the classes in ophthalmology are the best extant. After a ticket is secured—the maximum for a perpetual ticket is fifty dollars—the student is known as a "junior assistant." After six months of this service he becomes eligible for appointment as "clinical," which is confirmed after one year's service. After two years is a chief clinical's billet, then through seniority advancement to the assistant surgeon's desk.

At Fuchs' clinic the work proceeds in a rapid and systematized way. The first hour in the morning is filled by Fuchs, who rapidly demonstrates the cases with the aid of two assistants, who, in turn, present them to each student. The operating room is then opened, where the "Master" takes up the more important cases. Later the various assistants operate upon the cases assigned them. A skilled instructor may always be found for whatever investigation one may wish to make. While a knowledge of German is not necessary, it is of material assistance. The author says, "To use the favorite phrase of the Germans, Moorfields to apply and further develop knowledge and Fuchs' clinic for study and instruction."

M. D. S.

VISION—ITS RELATION TO SCHOOL WORK.—LESLIE, GEORGE L., Los Angeles (*The Woman's Medical Journal*, October, 1907), makes a strong plea for the general examination and supervision of the health of school children and says that pedagogy and medicine ought to cooperate in all possible ways. He mentions a number of points to be observed by the teacher and describes the normal eye and the variations from normal in different refractive conditions. He gives a series of tests to be used in detecting refractive errors and muscle imbalance, with methods of recording findings on "health and development blanks." He devotes some space to the "hygiene of eyesight," under which sizes of type, spacing and irradiation are considered. The writer says the results of the latest and most careful experiments along the above lines, together with the subject of school hygiene as a whole may be found in the

following list of books: "Personal Hygiene," Pyle; "Physical Nature of the Child," Rowe; "School Hygiene," Hope and Brown; "School Hygiene," Shaw; "School Hygiene," Kotelmann; "Dynamic Factors in Education," O'Shea. These books are plain and direct in statement and not over-technical.

M. D. S.

FRAUD UPON THE EYES. —FRENCH, WILFRED A. (*Review of Reviews*, October, 1907), in the *Photo-Era*, protests against cheap glasses and urges all persons with weak eyes to consult an oculist, not an optician. He points out the danger of using cheap, inferior opera glasses. The low price of some (\$2.00 to \$3.00) little more than pays for the mother-of-pearl, their chief attraction. The optical properties and not the external appearance should be considered in purchasing an opera glass. The distance between the centers of the eye pieces should correspond exactly with the interpupillary distance. This item should be as familiar to a person as his height or weight. The opera glass provided by the management of a theater fits the eyes of only a few, but this difficulty may be remedied by the use of the variety known as the jointed bar opera glass. A scientifically made glass of this type, in plain japan mounting, retails at about \$8.00; the kind in ordinary fixed mounting at not less than \$4.50, but this increase in price represents a superior production.

M. D. S.

SIX CASES OF CONGENITAL WORD-BLINDNESS AFFECTING THREE GENERATIONS OF ONE FAMILY. —STEPHENSON, SYDNEY, London (*Ophthalmoscope*, September, 1907). The patient seen by the author was a girl of 14 years, who was bright in every way except in reading. Vision normal with weak cylindrical correction. Her maternal grandmother had been similarly afflicted and was the mother of eight children, of whom four showed symptoms of congenital word-blindness. The girl's mother was one of the children who was exempt.

M. B.

A CASE OF ALEXIA IN A BOY OF FIFTEEN. —BALL, M. V., Warren, Pa. (*Ann. Ophthal.*, April, 1907). A boy of 15 years who has normal vision in each eye has always been unable to read except in the most rudimentary way. He is able to name the letters correctly, but can not form words from them. He has had persistent schooling since the age of 7 and has made good progress in all his studies except reading. The only illness he has had which might have a bearing upon this condition was a few epileptic convulsions at the age of 6. He has had none since.

M. B.

THE PHYSICIAN IN THE PUBLIC SCHOOL.—BLACK, MELVILLE, M. D., Denver (*Colorado Medicine*, September, 1907). While the examination of school children's eyes and ears would be more practicable in most communities if made by the teachers, as recommended by Dr. Allport of Chicago, the Colorado physicians discussing Dr. Black's paper thought that a qualified medical examiner should be appointed by the school board to visit the schools regularly. "The physician should examine the eyes of every child in the school for errors of refraction, congenital anomalies and disease. He should point out to the teacher these defects, and ask her to call the attention of the parents to the physician's findings and recommendations. He should not cease to give these warnings until the parents have seen fit to heed them.

"One hour a day in the school by an intelligent physician would work wonders in bringing about the desired result."

H. V. W. AND S. G. H.

MUSCLES.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE VARIOUS FORMS OF ABSOLUTE LOCALIZATION IN CONCOMITANT STRABISMUS.—OILM, Berlin (*Graefes Arch.*, lxvi, H. 1, June, 1907), divides the cases into three groups: 1. Those in which both eyes, in reference to fixation, are of equal value. Central impressions are sufficiently accurate for both right and left fixation. Excentric impressions are, on the contrary, quite inaccurately localized. 2. Those in which the eye, in reference to absolute fixation, are quite different, at least when both eyes take part in the visual act. The retinal image of one eye is always correctly localized: the retinal image of the other eye always falsely localized whether it lie in the fovea or excentrically. 3. This group corresponds to the first in that both eyes used singly and on exclusion of the squinting eye from indirect fixation are of about equal value in reference to absolute fixation. It differs from the first, however, in that when both eyes are used, the eccentric impression of the squinting eye is at times correctly localized.

The author summarizes as follows: False absolute localization is not pathognomonic of muscle palsies, but is present in a very decided proportion of certain forms of concomitant strabismus. Localization by the dimension of breadth is the product of lateral innervation and the location of the image upon the retina.

If the image lies in the fovea centralis, indifferently whether in the right or left eye, it will, in normal eyes and eyes of the second group (in the latter case when both eyes take place in the visual

act), be localized "straight ahead" as the result in the second and third group, of two different lateral innervations. W. Z.

ON THE TREATMENT OF ALTERNATING SQUINT.—COUTER, R. J., London (*The British Med. Jour.*, Nov. 2, 1907). The writer reported five cases of alternating squint in which, after an advancement and tenotomy, good fusion and stereoscopic vision were obtained. He had notes of four other cases in which he had failed to restore binocular vision of such a quality as to keep the eyes straight, but he had never failed to obtain fusion of stereoscopic pictures after correcting the deformity by operation. In dealing with alternating squints he considered the best course was to correct the deformity by operation, and as soon as possible to start training with the amblyoscope or some other form of stereoscope, and that the most suitable age for undertaking such treatment was between 12 and 16 years. C. H. M.

MYOPIA.

THE REAL CAUSE OF MYOPIA.—SCHULIN, CARL, Billings, Mont. (*Ann. Ophthal.*, April, 1907), believes that scrofulosis is the real cause of myopia and that the scrofulosis is caused by hypoleucocytosis. He enters into quite a discussion of the spermin theory of Poehl and Farchanoff. He explains the scrofulosis upon the above theory. He believes the reason we see singly is because we have only one center of consciousness. He also believes that the position of the eyes during sleep in a poorly darkened room is responsible for more myopia than a badly lighted school room. M. B.

ON TEMPORARY MYOPIA.—SCHIECK, F., Goettingen (*Klinisch. Monatsblaetter fuer Augenheilkunde*, xlv, July, 1907, p. 40), intends to show that, besides diabetes and icterus, other disturbances of metabolism may influence the refraction of the eye, by a case observed in the eye clinic of Goettingen: A blacksmith, aged 27, who claimed to have had perfect vision, observed for the last three days dazzling before his eyes when looking into the distance, which he attributed to his general weakness from attacks of diarrhea during the last ten days. V. = 0.1, myopia — 4.00, ascertained by skiascopy and direct method under atropin, so that strain of accommodation was excluded. After a week his intestinal trouble had disappeared with restoration of normal vision. Skiascopy showed emmetropia.

Since an elongation of the longitudinal axis of the eyeball is not likely, Schieck assumes, according to the calculations of Hess, that

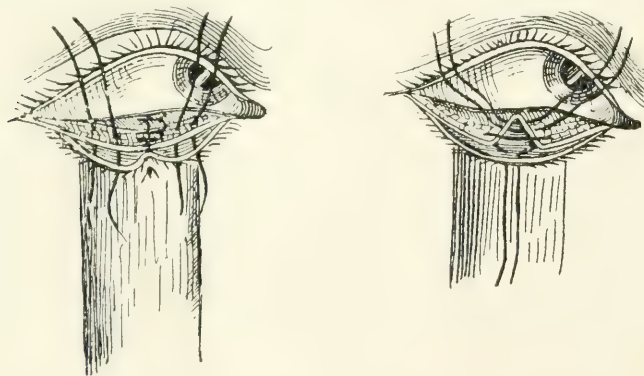
the cause of temporary myopia in disturbances of metabolism must be attributed to changes of the curvature of the lens. In this case temporary myopia was brought about by the loss of water in consequence of profuse diarrhea. C. Z.

NERVES.

PARALYSIS OF THE FOURTH CRANIAL NERVE DUE TO TRAUMA, AND THE MEANS USED TO OVERCOME THE RESULTING PARALYSIS OF THE SUPERIOR OBLIQUE MUSCLE.—SNYDER, WALTER HAMILTON, Toledo (*Arch. Ophthalm.*, May, 1907, xxxvi, 388). In the above case there was a paralysis of the superior oblique, which increased during the first two weeks while the patient was taking iodids, and improved when the paralyzed muscle was exercised with the Worth-Black amblyoscope. The author calls attention to the comparative rarity of this form of paralysis and to the unusual method of treatment. He reports his case in detail and adds that "we may confidently expect a complete recovery of function in from four to seven months." W. R. M.

OPERATIONS.

A SLIGHT MODIFICATION OF THE KUHN-MÜLLER OPERATION FOR SENILE ECTROPION.—LEDERER, Leipzig, (*W. f. Therap. u. Hyg. des Aug.*, Aug. 1, 1907), has met with complications in performing



this operation in the usual manner and has overcome them by doing it in the following manner: The lid is so split that the triangle of cartilage to be removed occupies the middle of a trapezium of split tissue. The tarsal sutures are placed exactly as described by Czermak. The excess of skin following the uniting of the edges of the tarsal wound and consequent shortening of the inner surface of the lid is distributed by sutures placed along the continuation, on either side of the triangle, of the intermarginal incision. Ac-

cording to the author it is necessary that the sutures at the base of the resected portion of the cartilage should be so placed that it coaptates the middle of the skin plate with the line of the cartilage incision, whereafter one or two sutures will straighten out the two skin pockets which had been thus formed. W. Z.

INJURY OF THE ORBIT BY A RIFLE SHOT. REMOVAL OF THE BALL, WITH PRESERVATION OF SIGHT, BY MEANS OF KROENLEIN'S OPERATION.—ZIMMERMANN, W., Gœrlitz (*Klinische Monatshefte fuer Augenheilkunde*, xlv, August-September, 1907, p. 195). A man, aged 16, who had been shot in the left orbit, presented intense exophthalmus, swelling of the upper lid, which could spontaneously be scarcely raised, motility of the globe upwards very limited, outwards totally abolished. The pupil reacted sluggishly, was larger than normal, V. = 5/xxxv. T. and V. F. normal, no changes of fundus except small hemorrhages of the retina outwards and downwards. The wound of entrance of the 9 mm. projectile was situated at the border of outer and middle thirds of the lower orbital margin. Of general symptoms, vomiting and bradycardia were observed and pulse of 48. The Roentgen photograph revealed the projectile in the posterior portion of the orbit inwards of the posterior portion of the optic nerve, while the clinical symptoms pointed to its seat outwards of the optic nerve.

After four days, Kroenlein's operation was performed, but not until a longitudinal incision of the external rectus was made the ball was found near the optic foramen close to the optic nerve and extracted. The wound healed *per primam*. Exophthalmus disappeared, motility of the eyeball outward was slightly impeded without causing diplopia, pupillary reaction was normal, V. = 5/x (astigmatism). C. Z.

LACRIMAL SAC PROTHESIS.—ZIMMERMANN, Gœrlitz (*Die Ophth. Kl.*, September, 1907), recommends this procedure in cases of chronic inflammation of the sac in which the sac can be removed *in toto* without perforation of the skin and in which there are neither complications of the ethmoid nor total obliteration of the lacrimonasal canal. The author's method of extirpating the sac is as follows: The incision, 3 to 5 mm. in length, is carried vertically through the skin down to the crista. With a periosteal rasp designed by Leschafft the periosteum is elevated over the entire extent of the wound down to the fossa lacrimale, which may be recognized by its resistance. When the posterior wall of the sac has been separated, one easily sees the entire field of operation. An assistant

draws the sac, together with the surrounding tissue, towards the nose. The operator grasps the outer skin with the forceps and with dull scissors dissects it loose from the sac; never the latter from the skin. In this way the danger of perforating the skin is avoided and the mouth of the canaliculus is rapidly reached. In cutting through this, keeping closer to the sac than to the skin. When the anterior wall is entirely freed, the further enucleation is completed by going either from the head of the sac downwards or from the nasal canal upwards. After brief tamponading of the surrounding tissues, the prothesis may be inserted. It rests well in the fossa lacrimale and does not alter its position during the suturing of the wound. Great stress is laid on the dressing, which should consist of a large tampon which rests tightly upon the wound for the first days. Stitches are removed on the fifth day. The tube is made of silver. In an unsuitable case in which the tube was removed at the end of eight weeks' time, its lumen was found free, with no trace of granulation tissue. W. Z.

EXTIRPATION OF THE GASSERIAN GANGLION AND NEUROPARALYTIC KERATITIS IN MAN.—WEISS, JR. (*Die Ophth. Kl.*, July 20, 1907). As possibly throwing some light on the lesion in neuro-paralytic keratitis, Weiss records the following case: A man, 47 years of age, who had suffered from intense left facial pain for six years, had had, four years previous to Weiss' examination, resection of the Gasserian ganglion. He complained of profuse sweating while eating, drinking and during waking hours and independent of external temperature, occurring first on the paralyzed side. He had at times nocturnal pain in the left eye, although the eye is insensitive. He feels a foreign body after it has reached the retrotarsal fold. Examination showed that the right side of the face was reddened and that the sweat fell in pearls from the skin on this side, whereas the left side was scarcely moist. The facial nerves were intact. Sensibility in the area of distribution of the left trigeminus was entirely lost. On the left side there was a slight ptosis and the lid could not be voluntarily raised as high as that on the right side. Lid closure was normal during waking and sleeping. There was no exophthalmus and T. was normal. There was slight fibrillary twitching of the left orbicularis. The pupils, the movements of the eyes and the lid reflex were all normal. The cornea of O. S. was clear and entirely insensitive. The eyes were free from injection. The author says that here we have a case in which, after four years following permanent division of the trigeminus, no trace of neuroparalytic keratitis has ever been present.

He further says that from this and similar cases the practical conclusion can be drawn that the danger from neuroparalytic keratitis after extirpation of the Gasserian ganglion is very slight, so that from the ophthalmologist's standpoint this operation is not contraindicated for unilateral trigeminal neuralgia. At most, the danger to the eye exists only a few days subsequent to the operation, and opinion is divided as to the necessity at this stage for the use of atropin and the compress bandage.

W. Z.

GRAFTING OF EPIDERMIS AFTER ENUCLEATION IN SHRUNKEN CONJUNCTIVAL SACS. KUHN, HERMANN, BORD (*Zeitschr. f. Aug. u. Augenheilkunde*, xviii, p. 152). After enucleation of eyes in shrunken conjunctival sacs (from inveterate trachoma, scars from combustion or cauterization, etc.), the wearing of a prothesis is often impossible. Kuhn devised the following method to obtain a larger socket for the insertion of an artificial eye: During enucleation the tendons of the recti muscles are fixated by sutures to the conjunctiva. After stopping the hemorrhage, a Thiersch graft from the inner surface of the upper arm or thigh is transferred to the wound and tucked as far as possible under the conjunctiva. It is held in position by a ball of wood, 18 to 20 mm. in diameter, or a hydrophile dressing, over which the palpebral fissure is closed by a suture, grasping 2 to 3 mm. of the upper and lower lid margins. This remains for three to four days. Healing takes place without reaction.

C. Z.

MAGNET OPERATIONS IN OPHTHALMOLOGY.—HIRSCHBERG, J. (*Medicinische Blätter*, Sept. 7, 1907). The author performed 347 magnet operations during a period of 27 years. The belief that a splinter which found its way into the interior of the eye would become imbedded without causing any irritation must be abandoned.

He opposes the practice of bringing a freshly injured eye, in which the presence of a piece of iron is suspected, immediately before a giant magnet for diagnostic purposes; the supposition that when the patient feels no pain during the action of the giant magnet there is no iron in the eye is erroneous.

The writer uses three forms of magnets, viz.: the giant magnet, the medium-sized magnet of Schloesser, and his own hand magnet.

From 1896 to 1903 he removed from the retina or vitreous pieces of iron with the electromagnet in 64 cases, with the following results: In 36 cases, i. e., 56 per cent., vision remained good; in 6

cases, i. e., 9 per cent., vision was lost, but the form of the eyeball remained intact; in 22 cases, i. e., 34.5 per cent., the injured eyeball had to be removed, and in 4 cases extraction was not successful at all.

J. G.

LOCAL ANESTHESIA IN EXENTERATION AND ENUCLEATION OF THE EYEBALL.—SIGRIST (*Wiener Medizinische Wochenschrift*, Aug. 24, 1907). The author employs a bent needle and a 2 per cent. novocain solution, to which he adds a few drops of adrenalin; he injects the fluid into the point of entrance of the optic nerve between the eyeball and the wall of the orbit. The patient has no pain during the operation, although the inflammatory process and sensitiveness to pressure before operation might have been very severe.

J. G.

ON THE PRODUCTION OF A FILTERING CICATRIX IN CHRONIC GLAUCOMA.—LAGRANGE, FELIX, Bordeaux, France (*Ophthalmoscope*, September, 1907). The sclera is punctured at a distance of 1 mm. from the limbus, and the counter-puncture is made at a corresponding point. The sclera is divided in the iridocorneal angle. In determining the incision, the cutting edge of the blade is directed backwards in such a way as to bevel the sclera, like the mouthpiece of a flute. When the knife is beneath the conjunctiva, a large conjunctival flap is made. The conjunctival flap is raised by means of fine-toothed forceps, and, without interfering with the mucous flap, a sufficiently large piece of the sclera is resected from the exterior lip of the incision by the use of an extremely sharp pair of curved scissors. Iridectomy is now performed in the usual way. The flap of conjunctiva is used to cover the wound. After healing has taken place the cicatrix is flat, except when the tension is increased, when the liquid in passing into the subconjunctival space elevates the mucous membrane, which becomes ampulliform. He has performed the operation in 27 cases and obtained a filtering cicatrix in 20 cases.

M. B.

DRAINAGE OF THE ANTERIOR CHAMBER FOR HYPERTENSION AND PAIN, WITH HORSEHAIR DRAIN.—ROLLET (*Revue Generale d'Ophthalmologie*, July 31, 1907). The author uses this method for the reduction of ocular tension and for the removal of infectious material and also of pain. He reports two cases, in both of which vision had been lost, but in which there was hypertension and pain. Relief in both.

B. E. F.

TECHNIC FOR EXPOSURE AND RESECTION OF THE CERVICAL SYMPATHETIC NERVE.—SERBILAN, PIERRE, SCHWARTZ, ANSELINE, and HEINECKE, ACINE PAUL (*Surgery, Gynecology and Obstetrics*, October, 1907; *Revue de Chirurgie*, Paris, 1907). A concise description of this operation is worth the reading by those interested.

H. V. W. AND S. G. H.

OPTICS.

TREATMENT OF AFFECTIONS OF THE OCULAR NERVES OF CENTRAL ORIGIN DUE TO SYPHILIS.—WATERMAN, O. (From the polyclinic of Prof. P. Silex, Berlin. *Berliner Klinische Wochenschrift*, 1907, No. 35, p. 1107). For some time Silex has limited the treatment of tabic atrophy of the optic nerve to the (ineffectual) application of tonics, as in his experience in most cases mercury in form of inunctions or injections led in a surprisingly short time to complete amaurosis of so far good or sufficient sight, and iodids yielded no results. He, therefore, tested the action of atoxyl in 10 cases of cerebral lues and tabic atrophy, and Waterman reports in detail the clinical histories. "We began with hope and ended with utter disappointment." 1. Atoxyl gave no favorable results. 2. From his experience the author warns against atoxyl in the treatment of cerebral lues or tabic atrophy of the optic nerve. In one case a central scotoma developed which had to be ascribed to the action of atoxyl. Four cases showed such rapid and intense deterioration of vision, as never observed under mercurial treatment. In one case sudden intestinal catarrh with icterus, and in another peculiar nervous symptoms set in, which promptly subsided after atoxyl was discontinued. In almost all cases treatment with atoxyl created boring pains in arms and legs, great debility and anorexia.

C. Z.

READING WITH THE LINES PLACED VERTICALLY.—DIMMER, Graz (*Graefe's Arch.*, lxvi, H. 1, June, 1907). The case in which this phenomenon was observed was one of nystagmus in a 9-year-old boy. The exact time of the onset of the nystagmus is indefinite, but it had been more marked earlier and was gradually diminishing. The boy's teacher had noticed that in reading wall tablets he invariably held his head inclined to his right shoulder and that at near reading he held the book so that the lines were at right angles to the line of vision and that the head was held straight. The examination confirmed these statements. There was quite marked horizontal nystagmus. The eyegrounds showed no changes. V. in O. D. .2, in O. S. .3. There was no abnormality in writing. In endeavoring to explain this phenomenon, the author says that

probably in all cases of nystagmus there is always, for a time at least, an apparent movement of the object observed. If we assume that in the present case this continued until the time the boy began to read, the relation of the nystagmus to the condition is readily seen. It is apparent that in horizontal nystagmus the letters will be more readily read if the line be held vertical to the basal line of the eyes, because, when so held, only movement of the letters occurs and the apparent image of one letter does not run into the image of the next succeeding letter. The author reproduced the conditions experimentally with a camera, and the negative obtained showed that the letters could be easily made out when the line was held vertically and the camera given a horizontal movement during the exposure; whereas when the line was placed horizontally and the camera moved horizontally the resulting negative gave a confused overlapping of the letters.

W. Z.

EXPERIMENTAL STUDIES ON THE DEPENDENCE OF VISUAL ACUITY UPON THE INTENSITY OF THE ILLUMINATION; THE PRACTICAL WORTH OF THE PHOROMETER OF HORI.—OGUCHI, CH., Tokio (*Graefe's Arch.*, lxi, H. 3, September, 1907). Oguchi's conclusions upon this subject are as follows:

1. Diminution of illumination causes diminution of visual acuity. The visual acuity is proportionate to the cube root of the intensity of the illumination.

2. The above law holds good until the illumination is diminished to 0.00375 and the visual acuity to 10/lxx (usual reckoning 20/lxx). When it is reduced below 0.00260 candle power and the visual acuity below 10/lxxx (according to usual reckoning 20/lxxx) the above law no longer holds. Beyond these limits the diminution of the visual acuity is proportionately more significant.

3. The experiments were made upon six healthy persons from 22 to 32 years of age, possessed of good visual acuity. The right eye was always used.

4. The phorometer of Hori is applicable for determination of visual acuity in weak illumination and also for the estimation of the threshold of the light sense. It is a very practical and simple apparatus which particularly recommends itself to military usage because of its ease of transportation.

W. Z.

OPTIC NEURITIS IN TUMOR OF THE BRAIN; A PLEA FOR EARLY SURGICAL INTERVENTION.—CHANCE, BURTON, Philadelphia (*Penn. Med. Jour.*, August, 1907, x, 877), discusses the subject of brain

tumor, accompanied by optic neuritis. He states that, as the most important factor in the production of the optic neuritis is increase in intracranial pressure, early operative measures are indicated and should be seriously considered in all cases in which medical treatment for a period of six weeks has proved unsuccessful. The author gives the symptoms of brain tumor, the ophthalmoscopic appearance of the fundus during the different stages of optic neuritis, and the importance of optic neuritis in affecting the surgical diagnosis and prognosis of brain tumor. He mentions the importance of the visual acuity as a factor in locating the site of the tumor.

W. R. M.

OPTIC NEURITIS OF PREGNANCY.—BONTE (*La Clinique Ophthalmologique*, Aug. 25 and Sept. 10, 1907). The author remarks that in the work of Berger and Loewy, on the ocular troubles in females from genital cause, that there, most clearly described, may be found the condition known as the optic neuritis of pregnancy. The cases cited by those writers are not very numerous; nevertheless they were similar to the case of Bonte, with the exception of one case in which there was albuminuria and for a certain time papillary edema, which Bonte also observed.

The case the author reports was 35 years of age, pregnant for the ninth time and in the ninth month of gestation; had four living children; patient quite fat, though had always been healthy. On Oct. 6, 1906, the woman began to lose vision in left eye and in three weeks the eye was blind. Vision of right eye began to fail two weeks later and was obliterated in fifteen days; pupils widely dilated; intense and persistent cephalalgia. Ophthalmoscopic examination of left eye November 28: papilla ovally elongated vertically, of grayish-red color, disc slightly elevated, edge indistinct; right eye, papilla circular, elevated, and border not clearly defined. Pupillary reflex abolished; retina free from lesions. Albumin in urine. Forceps labor Dec. 9, 1906. Patient seen again March 2, 1907. Optic papillæ were grayish on the nasal portion, with a whitish zone on the temporal side; no albumin in the urine. Subconjunctival injections were rejected by patient. Later (May 2) blindness complete.

B. E. F.

ORBIT.

TWO FATAL CASES OF ORBITAL CELLULITIS. HANSELMAN, HOWARD F., Philadelphia, Pa. (*Ann. Ophthalm.*, April 1, 1907), reports the case of an Italian baby of 4 months, who developed an orbital cellulitis without known cause which terminated in death from gen-

eral erysipelas. The autopsy showed the accessory nasal cavities to be normal. His second case was in a lad of 13 years who developed an orbital cellulitis following a blow on the right eye with an icy snowball. Pus was liberated from the orbit and the anterior cerebral fossa by operation, but death followed two days later. No postmortem was obtainable. M. B.

A CASE OF PULSATING EXOPHTHALMOS; LIGATION OF THE COMMON CAROTID; DEATH.—JACK, EDWIN E., and VERHOEFF, F. H. (*Ophthalmic Record*, October, 1907). A female, aged 54, bumped her right temple against a door; no attention was paid to it. Two days later the lid and tissues about the eye began to swell with increasing exophthalmos of a pulsating character. The condition became rapidly worse. Pressure bandage over carotid was of no service. Pain became intolerable. The common carotid was then tied. The eye symptoms improved, but the general symptoms grew worse and death followed four weeks later. The postmortem findings showed a sacculated aneurism of the right internal carotid artery which had burst into the cavernous sinus. An extended report of the histologic examination follows. M. B.

A CASE OF CICATRICIAL FIXATION OF THE EYES AFTER LUETIC NECROSIS OF THE NASAL ORBITAL WALL.—LAUBER, H. (From the first eye clinic in the University of Wien. *Zeitschrift fuer Augenheilkunde*, xviii, July, 1907, p. 41.) A gummous osteoperiostitis of the lacrimal and ethmoidal bones with necrosis, involving the nasal portion of the contents of the orbit, had led to cicatricial shrinking of the infiltrated tissues. After removal of sequestra the external skin was generally drawn into the fistula towards the nose and produced epicanthus. The most interesting feature was the lack of motility of the eyeballs on account of their fixation at the medial orbital walls. The pupillary distance was 48 mm., conveying at first the impression of convergent squint. The attempt to move the globes with a pair of forceps in a temporal direction was frustrated by an absolute non-elastic resistance at the nasal orbital walls. C. Z.

PATHOLOGY.

THE PATHOGENESIS OF IRIDOCYLITIS.—STEPHENSON, SYDNEY, London (*Ophthalmoscope*, October, 1907). Every case of iridocyclitis is of septic or toxic origin, better spoken of as exogenous and endogenous. The whole of the nutrient lymph of the eye is elaborated and secreted by the ciliary processes. Toxic agencies

circulating in the blood find their way into the anterior and posterior chambers through ciliary excretion. The same may be said of certain bacteria. The ciliary processes in consequence are especially prone to infection. Poynton, the discoverer of the micrococcus rheumaticus, has twice succeeded in setting up experimental iridocyclitis by injecting the micrococcus rheumaticus into the auricular vein of rabbits, and the anterior chamber was found in these cases to include leucocytes loaded with micrococcus. Grandmont found typhoid bacilli in iridocyclitis associated with typhoid fever and streptococci in a case of cyclitis resulting from erysipelas.

M. B.

CONTRIBUTION TO EXPERIMENTAL SYPHILIS OF THE CORNEA OF THE RABBIT.—MÜHLENS, P., Wilhelmshaven. (From the Institute of Infectious Diseases at Berlin and the Bacteriological Institute at Wilhelmshaven. *Deutsche Medizinische Wochschr.*, 1907, No. 30, p. 1207), produced by inoculating the juice of syphilitic glands into the cornea of rabbits, typical keratitis and found, six weeks after the infection, numerous spirochætæ pallidæ in pieces scraped from the cornea. A monkey (macacus) inoculated with these scrapings showed, after two weeks, an indisputable primary affection at the eyebrows. From this the cornea of a rabbit was infected on March 27, and at the end of May typical keratitis developed. On June 3 scrapings of the cornea contained many spirochætæ.

This transmission of spirochætæ pallida (man, cornea of rabbit, monkey, cornea of rabbit) was so far not known.

Mühlens also succeeded in producing keratitis in the rabbit by infecting the cornea with juices of the organs (lungs, liver and suprarenal capsules) of congenitally syphilitic children who had died one and one-half hours previously.

C. Z.

INVESTIGATIONS ON THE PRESENCE OF BACTERIA IN THE CONJUNCTIVAL SAC UNDER ASEPTIC DRESSINGS AFTER CATARACT OPERATIONS.—NAPP, OTTO. (From the eye clinic of Prof. J. von Michel in the University of Berlin. *Zeitschr. fuer Augenheilkunde*, xviii, September, 1907, p. 198.) Before and a few days after cataract operation, the conjunctivæ of the lower lids of 171 patients were swabbed with a platina oese and the contents rubbed into serum agar, prepared according to Wertheim, and agar. The observations, arranged in tabular form, gave the following results: 1. In cases in which before the operation no bacteria were found in the conjunctival sac, the bacteria generally get there after the

operation under the bandage. As a transmission from the nose may be excluded, very likely some germs have been previously on the conjunctiva which did not come in contact with the oese. A small percentage of conjunctival sacs remains free from bacteria. 2. The number of bacteria before operation are generally increased afterwards. 3. The sometimes considerable number of bacteria, pathogenic or not pathogenic, have no influence upon the healing of the wound. Here the formation of a large conjunctival flap, and its careful adjustment, are essential. 4. The occurrence of bacteria, also of those not pathogenic for the eye, may occasionally cause conjunctivitis. A certain disposition of the individual or the mechanical irritation of the conjunctiva by the grasp of the fixation forceps are of some influence. The inflammation yields to proper treatment.

Many operators, dreading the multiplication of germs, have discarded all dressings. Since, however, the increase of bacteria under the bandage has no influence upon the healing of the wound, the author sees no reason to abandon a method of treatment which secures rest and protection for the eye operated on, especially as investigations in the clinic of Axenfeld have shown an increase of bacteria under a wire mask, under which the eyes were kept closed, as well as under a wire mask under which the eyes were left open and the lids could be moved.

C. Z.

EXPERIMENTAL INVESTIGATIONS ON THE DELETERIOUS INFLUENCES OF NOVOCAIN ON THE TISSUES.—VERDERAME, PH. (From the eye clinic of Prof. C. Mellinger in the University of Basel. *Zeitschr. fuer Augenheilkunde*, xviii, September, 1907, p. 191), studied the action of novocain in solutions of 2, 5 and 10 per cent. on the cornea of rabbits and man with Westien's loupe and fluorescein stainings. Instillation of a 2 per cent. solution alters the corneal epithelium, while solutions of increased concentrations destroy it. The changes commence with dryness of the corneal surface, followed by elevations and erosions of the epithelium, with final extensive defects of the cornea. Parallel experiments with cocain showed a gradual difference from novocain, which is more detrimental to the epithelium, but of less anesthetizing value than cocain. For complete analgesia a larger dose of novocain is required, which in many cases is impracticable, as it jeopardizes, by more intense destruction of the cornea, the results of operations. Novocain leaves pupil and accommodation intact (Schlueter, in his article, reviewed in this number of OPHTHALMOLOGY, observed slight mydriasis, which soon disappeared.—Reviewer). Novocain,

therefore, might in some cases supplant cocain, e. g., in operations on glaucomatous eyes, in which after cocain attacks of acute glaucoma have been observed.

Subconjunctival injections of 5 per cent. and 10 per cent. solutions of novocain caused degeneration of the cornea and slight erosions of the epithelium, intense swelling and injection of the conjunctiva, which did not disappear until after several days.

The greatest changes were observed after irrigations of the anterior chamber with 5 per cent. and 10 per cent. solutions of novocain: extensive damage of the corneal endothelium, followed by opacities of the parenchyma, severe irritation of the anterior uveal tract, indicated by exudations in the anterior chamber. Parallel experiments with cocain, in concordance with the observations of Reichmuth (*Zeitschr. fuer Augenheilkunde*, xvi), proved that cocain produces minimal or no injuries of the epithelium and endothelium and no exudations into the anterior chamber.

Novocain, on account of its detrimental action and its relatively small anesthetizing value, is not able to fully replace cocain. The eminently anesthetic power and the slight deleterious properties on the living tissue so far secure the superiority of cocain as an anesthetic in ophthalmology.

C. Z.

PHYSIOLOGY.

MODERN EXPERIMENTAL PSYCHOLOGY: ITS METHODS AND APPARATUS.—(*Scientific American*, Sept. 7, 1907.) Many devices for psychological experiments are described and illustrated, a few dealing with the sense of sight. To record the movements of the eye and determine its fixed points, the eye is held immovable behind a narrow horizontal slit in the plate holder of a camera. Instead of the old method of recording horizontal movements of the eye by means of oblique lines marked on the sensitive film in distinction from parallel lines showing fixation of the eye, the time values of the forms being recorded, the method of photographing the eye directly, utilizing the eccentric surface of the cornea as a reflector, is now used. The movement of a bright vertical line reflected from the cornea is photographed. Such lines give clean-cut records which permit them to be magnified considerably, while the amount of light needed is comparatively small. A blue color screen is so placed with relation to an electric light as to project a beam of blue light into the eye while the subject is reading letters from a card. The light is then reflected back to the photographic plate. After describing and illustrating an appliance for the determination of the blind spot, an apparatus of the pendulum type for the

determining of the after-image effect is illustrated. The writer calls attention to the fact that after the retina has been stimulated by light for one second or less, the primary image disappears quickly, but at an interval of less than two seconds it is followed by a positive after-image; with some observers a brief stimulus is immediately followed by a negative after-image. M. D. S.

SYNERGIC MOVEMENTS OF THE EYELIDS AND MOUTH.—BEAUMONT, W. M., Bath (*Brit. Med. Jour.*, Sept. 11, 1907). The writer calls attention to the fact that such cases of mouth and eyes acting in unison are very common, especially in children who have some difficulty in opening the eyes, either from congenital disease or from acquired conditions, such as photophobia, and that this association is no mere pathological curiosity of rare occurrence, for it is to be seen in the ordinary expression of the emotion of surprise by gaping, although not associated with yawning.

But associated action of eyes and mouth is not confined to the expression of surprise alone, for any exaggerated attempt to open the eyes would seem to be accompanied by an opening of the mouth. This is frequently observed by surgeons in children suffering from photophobia, who commonly open their mouths in straining to open the eyes. The muscles of expression would seem to be the ones which are most easily put into action, and associated movements of them are common in other directions, especially in the young and in the inexperienced, who have not yet gained full control (and perhaps never may) of their muscles.

In the majority of cases of associated movements of the eyes and mouth which have been published, the patients have been children or young people. Regarding what becomes of these patients in after-life, the writer thinks that the associated movements tend to disappear as development progresses.

The writer concludes that associated movements of the eyes with the mouth are normal. "And if from any congenital or pathological condition, such as ptosis, an increased stimulation is called for, there is a tendency, especially in children, to generate an excess of nervous energy in order to open the eyes. The discharge, owing to the lessened insulating power of childhood, overflows in the direction of muscles which in bygone ages were commonly associated; that is, into channels (nerves) which subserve the purpose of producing the epiphenomenon of opening the month. These freak-like and apparently purposeless associated movements of all sorts are reminders of our antique, though humble, ancestry; mere echoes ringing down the files of time." C. H. M.

THE NATURE AND MODE OF PRODUCTION OF THE INTEROCULAR FLUID.—SCALINOI (*Arch. d'Ophthalmologie*, June, 1907), maintains that the aqueous humor is not, as Leber and others have thought, a produce of simple filtrations through the ciliary processes, but is a secretion of the ciliary epithelium. The principal phenomenon of this secretion appears to consist in the passage of salts, particularly of chl. of sodium, into the ocular cavity in quantity sufficient, by the absorption of water, to maintain a constant hydraulic pressure in this cavity.

G. C. H.

HOW IS THE INCREASED PURPLE COLORATION OF THE VISUAL ZONE OF THE RETINA OF RABBITS TO BE EXPLAINED? WEISS, Leipzig (*Graefe's Arch.*, B. lxvi, H. 2, July, 1907), answers this query by asserting that it is due to the decided lengthening of the external member of the rods which is recognized as the carrier of the visual purple. As in the visual zone all of the layers of the retina are thickened, there is a consequent doubling of the visual purple bearers in this area.

W. Z.

FURTHER OBSERVATIONS ON THE EFFECT OF THE ROENTGEN RAYS UPON THE HUMAN EYE.—BIRCH-HIRSCHFELD, Leipzig (*Graefe's Arch.*, lxvi, H. 1, June, 1907), records the anatomic findings in a second eye which had been subjected to the Roentgen ray in the course of the treatment of a carcinoma in the region of the outer commissure. As the reduction in the vision could not be attributed to any other cause, it was supposed by the author to have been due to the effect of the rays upon the normal elements of the eye. Subsequently the eye had to be sacrificed in a radical operation for the removal of the growth, but twelve hours before so doing it was subjected to an intense exposure to the rays. The important anatomic findings were as follows: In the cornea at several points, amidst normal surroundings, beneath the epithelium and in the anterior layers were small foci of connective tissue cells. At these points Bowman's membrane was destroyed (old scars resulting from the early application of the rays). The blood vessels of intermediate caliber of the iris and ciliary body presented vacuolization of the intima. The lens and vitreous were normal. The retinal ganglion cells showed pronounced evidences of degeneration. The principal changes were destruction of the chromatin substance and vacuolization of the protoplasm. There was no evidence at any portion of the retina of inflammatory process. The pigment epithelium and the chorioid presented no pathologic changes. The macula showed no signs of cystic degeneration and

the optic nerve was free from atrophic or inflammatory changes.

The author considers the changes noted as having been due to the Roentgen rays. That they were not artifacts follows from the freshness of the material, the employment of unobjectionable methods and the absence of changes in the rods and cones. In this case there were no complicating conditions to be considered as in the previously examined eye. The correspondence of the changes with those found in other human eyes and in the eyes of animals exposed to these rays confirms the author's views. Especially characteristic may be considered the vascular changes. Birch-Hirschfeld thinks that the retinal changes dated back to the first application of the rays, because experimentally these changes appear only after a period of latency. The ganglion cell changes may have been of more recent origin, due to the exposures made just before the enucleation because of the analogy to the findings with the radium rays. The fact that the nuclei of the ganglion cells were well preserved conveys that the function of these cells was not entirely destroyed. The absence of macular changes is explained by the care observed in the early use of the rays, and that sufficient time had not elapsed after the final exposure for exudative changes to occur.

The findings in this case make it questionable whether the cystic changes in the macula noted in previous cases were of Roentgen ray origin.

The author thinks that we are justified in believing that both the vascular and the retinal ganglion cell changes were due to the rays.

Birch-Hirschfeld emphasizes the importance of combating recent promulgations in which it has been stated that the use of the Roentgen and of the radium rays is without danger to the eye.

W. Z.

REFRACTION AND ACCOMMODATION.

THE ASTIGMIC LENS (CROSSED CYLINDERS) TO DETERMINE THE AMOUNT AND PRINCIPAL MERIDIANS OF ASTIGMIA.—JACKSON, EDWARD, Denver (*Ophthalmic Record*, August, 1907). The more sudden the change in the axis of a cylinder can be made before the eye under examination the easier it is for the patient to give accurate answers. The author finds that his astigmatic lens of one-quarter diopter cylindric power when placed with its plus axis 45° to either the nasal or temporal side of a $+ 1.00$ cyl., ax. 90, causes the axis of the combined lenses to jump 7° in the direction of the plus axis of the astigmatic lens. By rotating the astigmatic lens the plus axis is changed suddenly from 45° to 135° and the axis of the

+ 1 cyl. is thus suddenly changed from 83 to 97, enabling the patient to make quick comparisons. The effect of an astigmatic lens 0.50 D. cylindric effect is to deviate the axis 13° and the effect of an astigmatic lens of 1.00 D. cylindric effect is to deviate the axis 22.5° . M. B.

OCULAR HEADACHE.—WÜRDEMANN, H. V. (*The Wisconsin Medical Journal*, October, 1907). Discussing ocular headache in the symposium on headache before the Wisconsin State Medical Society, Würdemann states: "In my opinion, refraction work is generally well done in America, and the relation of the eyes to headache is understood, believed and properly attended to by all reputable physicians. Oculists who habitually use cycloplegics do very good refraction work. I certainly do not find occasion to criticise the work done or change the glasses of every one out of fifty who come to me who had previously had their refraction corrected by other ophthalmologists.

"Slightly under (we generally give under-correction in hyperopia, fully correcting the manifest and usually one-half to two-thirds of the latent hyperopia) or over correction is the same to the patient as a half-inch more or less in the length of the cripple's crutch—he can go fairly well with crutches of slightly different sizes. Glasses are crutches, anyhow, and we can only approximate emmetropia by correction of refractive errors.

"I wish it definitely understood that I plead for careful correction by properly credited physicians and deplore the slipshod work of the unqualified prescriber and the spectacle seller. To a medical man this work is not difficult, and, as at least 75 per cent. of people who have chronic headaches need glasses, though he may not do optical work himself, he should know enough about it to recognize the ocular signs and send his patient to a proper place for the prescription of lenses." S. G. H.

EYE-STRAIN.—FLOYD, THOMAS W., Peoria (*The Lancet-Clinic*, July 13, 1907). After discussing the importance of the recognition of eye-strain and the causes, the writer describes many of the local and general symptoms. He directs attention to neuralgia, affecting the supraorbital nerve, a common result of hyperopia, which commences over the eyes, spreads to the back of the eye, and in nervous people may spread over the entire head. Much consideration is given to the treatment by means of lenses and prisms when needed, and the fact emphasized that "just as the varying condition of a patient requires a change in his medicine, so the

changing condition of the eye often requires an alteration in the correcting lenses, and no glasses should ever be considered as permanent.”

M. D. S.

ON CHANGES OF CORNEAL ASTIGMATISM AND CORNEAL REFRACTION IN A PERIOD OF FIVE AND A HALF YEARS, ASCERTAINED ON THREE THOUSAND DOUBLE MEASUREMENTS.—STEIGER, ADOLF. Zurich (*Zeitschr. fuer Augenheilkunde*, xviii, p. 193), measured the corneal astigmatism of 1,300 healthy eyes of boys and 1,700 healthy eyes of girls at the ages of between 6.25 and 7.25 years, and then again after 5½ years, thus obtaining 6,000 measurements, with the following results, in tabular arrangement:

I. Identical phenomena in boys and girls: 1. Corneæ with low or perverse astigmatism are very apt to remain unchanged from the sixth to the twelfth year. 2. Moderate astigmatism (1.25 to 2.00) shows a marked tendency to decrease. 3. This tendency predominates in the groups of high astigmatism, so that astigmatism remaining equal forms an exception. 4. The increase shows the opposite behavior. It amounts to very much in the extreme degrees, to a low percentage in the medium groups.

II. Differences between boys and girls: 1. The deviations between the two measurements are throughout greater in boys in all medium groups. 2. The preponderance of deviations in boys consists entirely in decrease of astigmatism. 3. This is more frequent and shows a larger percentage in the higher degrees in boys than in girls. 4. The increase in all groups is without exception more frequent in girls than in boys.

The curvature of the cornea shows a great similarity with the changes of astigmatism; great number of cases with flattening. great number of remaining stationary, exceptional increase of curvature:

I. Identical in both sexes are the following: 1. About half of the corneæ grows flatter within the 5½ years. The other half remains the same. Exceptionally higher curvatures are encountered at the second measurements. 2. The flattening preponderates in the originally more curved corneæ. Thus the original differences between the corneal refraction of the individual eyes seem to equalize.

II. Differences in both sexes: 1. The flattening is greater in girls than in boys. 2. The increase of flattening with the degree of the original refraction of the cornea is much more marked in girls than in boys.

C. Z.

CHANGES OF THE EYE IN ACCOMMODATION.—DE VRIJS, W. M. (*Tydschr. v. Gen.*, Nov. 17, 1906), mentions the chief symptoms observed during accommodation: 1. Narrowing of the pupil; 2, the radius of the anterior lens surface in the center becomes smaller; 3, the anterior lens pole comes forward; 4, the curvature of the center of the posterior lens surface becomes smaller; 5, the periphery of the anterior lens surface becomes flatter (Tscherning, Grossmann), but not always (Hess). The periphery of the posterior surface of the lens also becomes flatter (Grossmann). The symptoms under 2, 4 and 5 mean the formation of a lenticonus anterior and posterior. 6. The diameter of the lens becomes smaller (Coccius), from 12.25 mm. (homatropin) to 10.25 mm. (eserin) (Grossmann). 7. The lens becomes thicker, from 3.6 to 4 mm. (Helmholtz), from 3.14 mm. (without alkaloid) to 4.44 mm. (eserin) (Grossmann). 8. The posterior lens pole goes backward 0.8 mm. (Grossmann); not or slightly (Helmholtz).

In the laboratory of Professor Straub the experiments of Heine on pigeons and two monkeys have been repeated with analogous results: with pigeons after curare or nicotine instillations constant differences of the ciliary muscle in the two eyes are found, also in the pupillary width, but no distinct nor constant differences of the lens could be found. In the monkeys' eyes the difference of the pupils is marked, and in the eserine eye the processus ciliares are more moved towards the lens, and the circular fibers come more to the front than the longitudinal.

The entire series of experiments could be used in favor of Helmholtz's theory if only the strange fact did not happen that we can not fixate with our chemical agents (constant) the accommodative change of the lens. What can be the cause? To Helmholtz's theory the lens is always in abnormal equilibrium, and only the contraction of the ciliary muscle gives it the opportunity to take its original form. We can fix the contracted ciliary muscle with chemical agents; the lens may quietly keep its own form; why does it not do it? We say, with Hess, that we have no good fixative agents. From the other side one can imagine that the lens has its original form in the non-accommodating eye, and that it is brought temporarily during accommodation in an abnormal form not corresponding with its structure and equilibrium. If this should be the case, one could imagine that during the action of the chemical agents, which come in time to fixate the contracted muscle, the lens found time to take again its own normal form, that with the weakest refraction.

De Vries finds no support in the anatomy of the eye for the Schoen-Tscherning theory of accommodative tension of the zonula. It is worth while to look out for other arguments which make Helmholtz's theory less acceptable. 1. Is it *a priori* probable that the lens is in abnormal equilibrium during the whole life, and only that it can take its proper form with maximal accommodation, which means never in practice? 2. May we consider this form of the accommodating lens with its lenticonus anterior and posterior to be the natural true lens form? 3. The lens as found in the dead has the shape of the non-accommodating, and is not in favor of Helmholtz's theory. One may suppose that the zonula still tends the lens in the lax cadaverous eye; when the zonula is cut through, then the lens curvature increases, but never as much as during accommodation. Heine found 30 eyes to have 8 to 9 mm. as smallest radius. These arguments, together with the attempts of fixating the lens in accommodation, are not strong enough for saying that Helmholtz's theory of accommodation is wrong, but certainly enough to consider the problem of the mechanism of the accommodation as being not entirely solved by Helmholtz.

Schoute states that the abnormal equilibrium of the lens in rest never can be the principal argument against Helmholtz's theory; he shows that the tendons of the foot- and hand-joints are tense during life, but on cutting them they are immediately retracted.

E. E. B.

RETINA.

RETINITIS, PROLIFERATING IN CHARACTER, IN DETACHED RETINA OF TRAUMATIC ORIGIN; REPORT OF A CASE WITH PATHOLOGICAL EXAMINATION.—SHOEMAKER, WILLIAM T., and HOSMIR, C. M., Philadelphia (*Ann. Ophthalm.*, April, 1907), report the case of a girl of 12 years who sustained some damage to left eye when 5 years of age. Four years later the pupil of this eye became white and, following this, injection of the eyeball and pain in the eye and headache was complained of. When seen by the author the eye was blind. It apparently had within it a large gray growth. The tumor was far forward in the vitreous. The appearance justified a diagnosis of glioma and the eye was enucleated. The pathological report showed complete retinal detachment; hemorrhage, formation tissue, new vessels, leucocytosis, lymphocytosis resulting in the formation of a solid mass in the anterior vitreous clinically resembling a glioma. The microscope, however, failed to show any true gliomatous changes.

M. B.

THE LATE RESULTS OF TREATMENT IN TWENTY-FIVE CASES OF SEPARATION OF THE RETINA.—DOR (*Ann. d'Oculistique*, June, 1907), makes use of local bleeding, electrolysis, punctures, etc., but the basis of treatment in all of the cases was saline injections of various strengths in the capsule of Tenon. In twelve of these cases he obtained a complete reapplication of the retina and full vision, in four a decided improvement, and in nine no result. Five of the twelve cases relapsed in about a month, five had partial relapse but remained unimproved, and there remained but two that were permanently cured.

His final statistics were, two complete cures, nine partial cures and fourteen failures.

He concludes that the treatment of the retina should not be one of two or three months, but of five or six months. Prolonged treatment is necessary and patients should not be allowed to resume their occupation for five or six months or a year. The reapplication of the retina is a commencement of cure, but not a cure.

G. C. H.

TREATMENT OF DETACHMENT OF THE RETINA.—DEUTSCHMANN, R., Hamburg, Germany (*Ophthalmoscope*, August, 1907), claims that he obtains better results from his methods of operating than are obtained by others with other methods. He does not operate while the fluid is above, but waits until it has gravitated below. He uses a double-edged linear knife which is directed tangentially to the eyeball and entered at a point just anterior to the fornix in the lower outer portion and is passed through the eye, bisecting it, and emerges at a point in the sclera exactly opposite the puncture down and inward. The conjunctiva is not penetrated. The knife is turned on its axis and the subretinal fluid allowed to escape. Both eyes are closed and the patient put to bed for from seven to eight days. The eye is kept under atropin. The author does not hesitate to repeat this operation ten to twenty times at sufficient intervals in order to obtain the desired result! In cases which bid fair to soon terminate in blindness he injects sterile animal vitreous into the eye. He uses for this purpose a special syringe which only allows a forward pushing of the piston. He uses an irido platinum needle or a double-edged knife needle. If the former is used it is inserted in the region of the ora serrata and the eye is bisected in the usual manner and some of the subretinal fluid let out before the injection is made. If the knife needle is used the eye is bisected in the usual manner, some of the fluid let out and then the injection made after turning the blade back into its proper

position. He has a chemist, Dr. W. Mielek, of Hamburg, supply him with the hermetically sealed glass tubes of fresh calves' vitreous.

M. B.

SCLERA.

NOTES ON A CASE OF EPISCLERITIS PERIODICA FUGAX.—SMITH, EDWIN TEMPLE, Queensland (*The Ophthalmic Review*, October, 1907). The writer had the opportunity of watching the onset and recovery of this affection during five attacks in a man under close observation for five years. A capable artist being at hand, three excellent colored illustrations are added to the paper. He describes the symptoms attending each attack and the effects of various forms of medication.

The writer ends his article with the following conclusions: 1. That episcleritis periodica fugax may exist in a severe form without any exudation of serum or round cells into the sclera or overlying tissue. 2. That a period of depressed general health precedes the attack. 3. That the affection may be para-gonorrheal (to use an analogy with syphilis) in origin. 4. That in such cases quinin in full doses is of more service than the so-called antirheumatic remedies. 5. That in the way of local treatment, warmth and protection are all that is needed; drugs which act on the pupil being unnecessary and probably harmful. 6. That the disease is not merely a mild and fleeting form of episcleritis, as suggested by many authors, but a distinct affection, whose not least prominent characteristic is that the eye is left after the attack in apparently normal condition, both as regards structure and function.

C. H. M.

SINUSES.

THE POSITION OF THE OPHTHALMOLOGIST IN THE TREATMENT OF DISEASES OF THE ACCESSORY SINUSES OF THE NOSE.—POSEY, WILLIAM CAMPBELL, Philadelphia (*Ophthalmic Record*, August, 1907). The ophthalmologist should so familiarize himself with the anatomy and the diseases of the accessory sinuses of the nose that any operative work upon the orbit from extension of disease of these sinuses can be performed by him in a thorough and intelligent manner. The ophthalmologist and not the rhinologist should be the one to handle the knife, but the assistance of the rhinologist is desirable. Several cases are reported by the author in illustration of his position.

M. B.

CONTRIBUTION TO OUR KNOWLEDGE OF OPTIC NERVE DISEASE IN CONNECTION WITH DISEASE OF THE POSTERIOR ACCESSORY

SINUSES OF THE NOSE.—BIRCH-HIRSCHFIELD (*Lancet*, *Ophthalmic* *Arch.*, May, 1907, lxx, H. 34), records the histories of four cases in which the above conditions were associated. In the first there was at first a relative scotoma, soon followed by an absolute scotoma with increasing exophthalmos. There was an inflammation of the antrum, ethmoid and sphenoid, the origin of which the author attributes to an abscessed tooth. That the inflammation finally extended to the superior orbital fissure was suspected from the paralyses of the oculomotor and abducens. The exophthalmos was due, in the author's opinion, to edema of the orbit from circulatory disturbance.

In the second case there was a central scotoma. The evidence of sinus involvement was slight, but the exclusion of other causes for the scotoma and the fact that the vision greatly improved upon removal of the sinus disturbance leads the author to attribute the cause to the latter condition. The absolute scotoma finally became relative.

The third case was apparently due to acute empyema of the ethmoid perforating into the orbit, originating from nasal infection. Owing to the suffering of the patient, no scotoma could at first be made out, but after the pus had been evacuated a relative scotoma could be demonstrated.

In the fourth case the exenteration of the orbit, which was made necessary because of the presence of a neoplasm in the sinus, gave the opportunity of studying the anatomical origin of the scotoma.

The author's conclusions from his own and other reported cases are:

1. That inflammatory affections or neoplasms of the posterior ethmoidal can spread to the orbit and optic nerve and produce early and severe damage to the visual acuity and can lead to blindness is well known.

2. Less well recognized is the fact that the visual disturbance may first appear as a central scotoma with intact peripheral field.

3. Because of the difficulty often experienced in diagnosing affections of the sinuses, of the posterior ethmoid and sphenoid cells, and the great danger to life and vision, the early demonstration of this symptom could be of the greatest significance.

4. A differential diagnosis between a toxic and an infectious optic neuritis and a disease of the optic nerve from an affection of the posterior ethmoidal cells would rest upon (a) unilateral nature of the condition (that it may be bilateral, however, is shown by the case of Fuchs' and by the second and fourth of the author's cases).

(b) The relatively acute development of the visual disturbance and the tendency to progression into an absolute scotoma, while later there is contraction of the peripheral field (this is especially emphasized because of Berger's assertion to the contrary).

5. The anatomical cause of the central scotoma, as the author's fourth case shows, may be due to an isolated disease of the papillo-macular fibers behind the position of the entrance of the vessels. It consists of an edema of the optic nerve, swelling and proliferation of the ganglion cells and a pronounced degeneration of the nerve fibers. Venous stasis of a circumscribed area, besides a toxic injury to the nerve fibers, has to do with its origin and location.

W. Z.

A STUDY OF OPTIC NEURITIS IN CONNECTION WITH NASAL ACCESSORY SINUS DISEASE.—FISH, HENRY MANNING, Chicago (*The British Med. Jour.*, Nov. 2, 1907). The writer is led to take up this subject again, because, although different authors have advanced the claim that sinus disease can induce an optic neuritis, reporting clinical cases in evidence thereof, yet this causal relationship appears still to be doubted by some authors—the two lesions, when noted, being looked upon as merely coincidental. A careful search in literature, however, has disclosed about 100 cases of both primary and secondary optic neuritis with all degrees of visual disturbance, from a papillitis with no reduction in vision to total loss of light perception. These cases, furthermore, show that each one of the nasal sinuses, the frontal and maxillary as well as the ethmoidal and sphenoidal, can cause an optic neuritis—a statement doubted by many to-day, owing to the generally accepted theory that the nerve lesion is due solely to an extension by continuity.

Before discussing this question he considers briefly sinusitis. The most common type of acute sinusitis is a cold in the head, with its congestion and feeling of fulness or heaviness, often accompanied by a greenish nasal discharge. Chronic sinusitis may lie dormant for months or years, only to become suddenly manifest at any time; these exacerbations are especially apt to appear during the inclement weather of spring and winter that predisposes to colds. Its symptoms are dizziness, pain, purulent nasal discharge (frequently wanting), nasal congestion, and sometimes pain on pressing the globe backward and involvement of the external ocular muscles.

The writer then refers to the frequency with which sinus disease is found by pathological anatomists, and to his previous efforts in proving that idiopathic ocular lesions are often but the symptoms

of an affection in the surrounding cavities. He believes that the proper examination of the sinuses would greatly reduce in number the etiologic factors of optic neuritis. He gives a table of 36 consecutive cases of optic neuritis in which nasal accessory sinus disease was present 26 times; another comprising 4 bilateral cases and 41 unilateral cases of various reporters in which there was improvement after treatment of the sinuses; and a third table of 39 examples reported by different observers in which no improvement followed treatment of the sinuses.

In conclusion, he emphasizes the fact that a negative nasal finding does not exclude sinus disease; he is convinced that such disease, instead of being a rare cause, is the most frequent cause of an affection of the optic nerve.

C. H. M.

DISTURBANCE OF VISION AND BLINDNESS PRODUCED BY CONTRALATERAL NASAL AFFECTIONS.—ONODI, ADOLF (*Orvosi Hetilap*, xxx, 1906). The author shows the relation that the posterior ethmoidal cells and the sphenoid bone bear to the optic nerve and to the chiasma, and by means of this he explains certain forms of retrobulbar neuritis and atrophy of the optic nerve; he also shows that unilateral, bilateral and contralateral disturbances of vision and blindness are often caused by affections of the posterior ethmoidal cells and the sphenoidal sinus.

J. G.

TWO CASES OF NASAL AFFECTION, WITH COMPLICATING OCULAR SYMPTOMS.—DELENEUVILLE (*La Clinique Ophthalmologique*, Sept. 25, 1907). Nasal affections are not, the author states, without their having an important etiological part in ocular affections, which is a natural sequence, considering the anatomical relations of the nasal fossæ and orbital cavity.

The first case Deleneuve reports was in a man, 46 years old, who had a retrobulbar neuritis. Examination of the nose demonstrated the existence of a sphenoidal sinusitis; the acuity of vision was 5/x in the left eye, while in the right eye it was with difficulty that fingers could be counted at 1 meter. Treatment was directed to the nasal affection and vision became normal.

The second case was in a young man, 15 years of age. He complained of having had, for some time, to blow his nose very forcibly. The sphenoidal sinus was intact. On March 5, ten days after the first examination, patient suffered from severe cephalalgia, no rise of temperature nor pulse change; no appetite; cerebral vomiting. The diagnosis of meningitis seemed a probable one. On March 11 intense nocturnal and diurnal cephalalgia; pupils di-

lated; diplopia over frontal region, intense pain. Pulse, 15 to 50; throat normal; no albumin in urine. Treatment, calomel. On April 18 the headache had disappeared, but the vomiting continued; double vision still complained of, pupils unequal, papilla of each eye choked. Under treatment the symptoms improved and vision became 5 v.

B. E. F.

SYMPATHETIC OPHTHALMIA.

PROLIFERATIVE UVEITIS. ZENTMAYER, WILLIAM, Philadelphia (*Ann. Ophthalm.*, April, 1907), reports two cases of sympathetic ophthalmia from proliferating uveitis in the exciting eye. In both cases a microscopical examination was made of the exciting eyes and well-marked proliferative uveitis found.

M. B.

TOXICOLOGY.

TOXIC NEURITIS DUE TO SULPHID OF CARBON (RETROSPECTIVE DIAGNOSIS): THERAPEUTIC REPORT ON SALINE INJECTIONS IN TONIC AMBLYOPIE (ALCOHOL, TOBACCO).—GOLESCIANO (*La Clinique Ophthalmologique*, Aug. 25 and Sept. 10, 1907). The author writes that if the ocular lesions of accidental cause (traumatisms, burns, etc.) form a well-studied group in these latter days, which is of assistance in the application of the law relating to these accidents, it is not true of those toxic infectious manifestations of slow evolution which attack the visual apparatus and have a bearing on ethylic or nicotin amblyopia. These latter conditions have a hygienic interest and the author reports three cases, he having, at the request of Professor Heim of Paris, examined a certain number of workmen who had been attacked with severe eye troubles and who work in vulcanizing caoutchouc. The course and the postophthalmoscopic symptoms force the diagnosis of retrobulbar neuritis. Three cases are reported. The first was that of a healthy woman of 42 years; had worked at the vulcanite factory three years and four months; during two years she worked ten hours a day. Three months before the visual trouble began she had headache, insomnia, numbness of the forearms, accentuated so far as to prevent holding an object in the hands. At night there had been attacks of suffocation, but without dryness of the nostrils. The visual trouble began in September, 1904, and in four months vision was so far reduced as to make it difficult for the patient to find her way alone. The case was treated at the Hotel Dieu, where iodid of potash and nux vomica were given; the condition remained stationary. In October, 1906, vision was apparently ameliorated. Examination Feb. 27, 1907, demonstrated that there was a slight

divergent strabismus, but no motile difficulty, no nystagmus, no lesion of anterior segment of the eye, pupils moderately dilated, the right reacting well to light, the left feebly so; consensual reflex preserved; accommodation almost *nil*. Optic papilla of right eye hyperemic, being less so at the nasal side; vitreous somewhat cloudy. Retinal arteries well defined, not undulated and without perivasculitis; veins slightly more voluminous. The fundus of the left eye shows a paler papilla, its contour, not well defined, is without pigmentation; incomplete scleral ring; the lamina cribrosa readily discernible; arteries and veins on papilla show retrocession; towards center there is a slight strangulation and a small hematic spot; macular region normal. Test shows that in the right eye, centrally, there is dyschromotopsia for yellow and green; no chromatic trouble in left eye. Visual field of each eye contracted, vision of right eye with $+1 = \frac{1}{2}$; of left eye with the same lens $\frac{1}{3}$. No specific history. Golesecano gives the history of two other cases.

B. E. F.

TRACHOMA.

SOME NOTES ON GRANULAR CONJUNCTIVITIS OR TRACHOMA. MANCHE, CHARLES, Malta (*Ophthalmoscope*, August, 1907). The contagiousness, the differential diagnosis between it and follicular conjunctivitis, and the prophylaxis is discussed. Its contagiousness is settled by the experiment of Addario, who inoculated the conjunctivæ of three blind people and obtained positive results in each case. It is important to differentiate between trachoma and follicular conjunctivitis because of the infectiousness of the latter. Prophylaxis is very important, and steps should be taken by all governments to control this disease among its poor classes. The Italian government has been appealed to by the Italian Ophthalmological Society to take hold of this matter, and the resolutions passed are reproduced in full.

M. B.

CONTRIBUTION TO THE ETIOLOGY OF TRACHOMA.—HYEHNSTÄEDTER, Berlin, and PROWAZEK, Hamburg (*Deutsche Medizinische Wochenschrift*, 1907, No. xxxii, p. 1285), found, while engaged in investigations on trachoma in Java, mostly in the neighborhood of the nucleus of epithelial cells of the trachomatous conjunctiva, round or oval, not perfectly homogeneous, masses, staining blue or violet with Giemsa, and in these sharply defined, very fine corpuscles, staining red when free, violet when covered by the blue masses. At later stages the corpuscles divide like cocci and present pictures similar to diplococci. The authors conclude

the corpuscles as parasites, the blue staining masses as products of reaction of the cells, caused by the entrance of the virus, for the following reasons: 1. They were always seen, under the microscope, in the same distinct characteristic manner and showed lively movements. 2. They could be inoculated on the conjunctiva of anthropoid apes (orang-utang), in the epithelia of which they were found in great masses, and could be further propagated from orang-utang to orang-utang. Inoculations on other animals were negative. According to the authors, these micro-organisms may have an etiological connection with trachoma and may, together with the morbid agents of variola, vaccine, scarlet fever, chicken plaque, icterus of the silkworms and perhaps the pox of carps, belong to a group for which they proposed the name "chlamydozoa."

The corpuscles correspond with those found by R. Greeff and Frosch.
C. Z.

TRACHOMA, CLINICALLY AND SOCIALLY CONSIDERED.—HANSELL, HOWARD E., Philadelphia, Pa. (*N. Y. Med. Jour.*, March 16, 1907). The writer reviews briefly the labors of modern investigators to discover the special causative germ of trachoma, and comments upon the limitation in the results of these investigations. He gives the frequency of its occurrence in proportion to the population in different countries. In discussing the undoubted contagiousness of trachoma, he points out that this depends upon two conditions: 1. The exudation of the trachomatous conjunctiva must contain germs or their toxins, and, 2, virus-bearing secretions must come into actual touch with another conjunctiva, in such a state of health or disease that it is made adaptable to the retention and activity of the germs. Just what condition is necessary to make the soil fertile has not been discovered.

The writer considers that trachoma has three stages: 1, The stage of development; 2, the stage of acute granulation, and, 3, the stage of cicatrization. The secretion is abundant in the first two and scanty or wanting in the third stage. Hence the danger of contagion is ever present until the third stage, when it is absent or reduced to a minimum. The measures recommended for the prevention of the dissemination of the disease are dwelt upon.

There can be no doubt of the wisdom of the inclusion of trachoma among the dangerous contagious diseases which shall cause affected persons to be excluded from admission to the United States. But the writer believes that the interpretation of this act is a proper subject of inquiry, if not of criticism, since it is left

entirely to the judgment of government officials, and the latter are apt to judge all cases of trachoma alike, while extended experience shows that the contagion is limited to the first and second stages when the disease is accompanied by a discharge, and that the danger of blindness during the third stage is remote. C. H. M.

EXTIRPATION OF THE TRANSITIONAL FOLD IN CASES OF TRACHOMA.—WYLER, JESSE S., Cincinnati (*The Lancet-Clinic*, Sept. 7, 1907), describes this operation as performed, and the after-treatment, at the Königsberger clinic. The majority of cases are treated surgically with good results. Medication with silver and copper, correction of any entropion, canthoplasties for blepharophimosis, and thorough opening of the lacrimal passages, are all preliminary steps undertaken as the occasion requires, and resorted to in order to have a localized area of granules upon which to work. Expression with the Kuhnt forceps is avoided where extirpation is intended, on account of resulting cicatricial tissue, making the conjunctiva adherent to the submucous layers.

The ideal period for operation is when there is a sharp demarcation line between the transitional folds and healthy bulbar conjunctiva.

After careful cleansing, the eye is cocaineized by instillations and injections of a 5 per cent. solution. The lid is everted and two self-retaining toothed forceps are fixed to the upper edge of the tarsus, so as to divide it into three equal parts. By dropping these forceps over the forehead a double eversion is accomplished and the entire fornix made visible, plainly disclosing the line of demarcation. Behind this line, with a sharp eye scalpel, an incision through the conjunctiva is made, running from one angle to the other. Two sutures of fine black silk are then passed through the bulbar border of the incision, including only tissue sufficient for a firm hold. These act as guys for the undermining of the conjunctiva. This is done with a fine curved scissors, very carefully, so as not to include any of the underlying tissue. The flap reaches almost to the limbus, if necessary, its size being guided by the amount of diseased tissue which it will be necessary to excise, for the mucous membrane flap must be brought up to cover the denuded area. When the undermining has been satisfactorily completed, the two forceps are removed from the edge of the tarsus, and the lid allowed to resume its normal position, and a few more drops of cocaine and adrenalin instilled. The lid is again everted, this time singly, and a Jaeger hornplatte is inserted between the *skin* surfaces of

the everted lid. By means of an instrument invented by Kuhnt for this purpose, the edge of the lid is grasped firmly without bruising and held in good apposition in its everted position to the horn-platte. The other boundary of the follicles is then sought, a transverse incision is made just above the limit, through the cartilage itself. With a sharp-pointed scissors, the extremities of this and the former incision are joined with a single cut. A careful dissection is then made of the tissue containing the granules from the strata below, avoiding the fibers of the orbicularis and the muscle of Mueller. A good-sized denuded area is left, which is to be covered by the flap of conjunctiva made in the first step of the operation. The sutures which have remained ununited during the entire period are used to bring the edges together, and perfect apposition is absolutely essential. This is accomplished by guiding the insertion of the needle to a point directly opposite the first stitch-holes by means of an anatomical forceps placed at the proper point when the lid is at rest. In the lower lid the diseased tissue between two transverse incisions is dissected from its underlying base and no flap made or sutures passed.

The operation may be performed on all four lids at the same sitting, as there is but little pain and the reaction not very severe. The patient is put to bed for two or three days with wet bichlorid pads over the eyes. After inspection of the sutures on the third day, the patient can go about with the eyes bandaged another three days. The sutures are removed on the eighth day and a 2 per cent. silver nitrate solution is applied daily for two weeks, then any diseased tissue found is snipped away with a pair of scissors. The blue stick is then used daily, and a cure is usually accomplished in five or six weeks after the operation.

In pannus, both trachomatous and eczematous, 20 per cent. yellow oxid of mercury has given excellent results. M. D. S.

TUMORS.

SUBCONJUNCTIVAL LIPOMA.—ROLLET, ETIENNE, LYONS, FRANCE (*Ophthalmoscope*, September, 1907). The tumor was found in the eye of a girl of 19 years and was situated a little behind the tendon of the external rectus. It was the size of a hazelnut. Duration, 1 year. It was cut down upon and removed by dissection without much difficulty. Microscopic diagnosis, fibro-lipoma. M. B.

PAPILLOMA OF THE CARUNCLE, WITH REPORT OF CASE.—LOEB, CLARENCE, ST. LOUIS (*Ann. Ophthalm.*, April, 1907). Twelve cases are referred to as comprising all that have been reported by others.

The author's case occurred in a woman, aged 21. History of something irritating left eye for two weeks. A small red mass, about the size of a radish seed, was found growing from the caruncle. It was freely movable except at the base, surface was uneven. The eyelids grasped it when closed. It was removed by the galvanocautery. Prompt healing. No recurrence. The growth was found to be a typical papilloma.

M. B.

A CASE OF EPITHELIOMA OF THE LID HEALED BY THE LOCAL APPLICATION OF CHLORATE OF POTASH.—ZINTMAYER, WILLIAM. Philadelphia (*Ophthalmic Record*, August, 1907). An ulcerating skin surface on the lower eyelid which followed upon the removal of a mole eight years before and healed completely after application of powdered potassium chlorate.

M. B.

EXORBITANT CASE OF CANCROID OF THE EYELIDS. SCHÜTZ-ZEIDEN, P., Berlin (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, July, 1907, p. 70), reports three cases, with illustrations, of immense ulcerated canceroids, which had started at the external canthus, the upper and lower lids, and occupied almost the whole half of the face, exposing the orbit, the optic nerve, the nasal and oral cavities, and in the third also the dura mater of the anterior and middle cranial fossæ. They showed how long the senile organism may bear such extensive destructions, which in the first case had lasted over four years, in the second fifteen, and the third twenty-one years. No metastases, except enlarged glands of the neck, were found at the postmortem examination of the third case, thus illustrating the difference between carcinomata and how benign a canceroid may be under circumstances.

C. Z.

CHLOROMA, WITH SPECIAL REFERENCE TO THE OCULAR SYMPTOMS.—MERRILL, C. S., and BEDELL, A. J., Albany (*N. Y. State Jour. of Med.*, October, 1907). The writers give the history of a patient suffering from this rare disease and, after examining the histories of the 44 cases thus far reported, summarize the ocular symptoms as follows:

Exophthalmos was the most common symptom. Orbital tumors ranged from small, smooth palpable masses not attached to adjacent tissue to firm growths replacing all orbital structure. The temporal veins were usually found dilated. The lids, in some cases, were edematous, puffy, swollen, everted, infiltrated with large movable tumor masses or with smooth swelling, not adherent to the skin. The conjunctiva has been reported as being anemic, con-

gested with venous dilatation, brown infiltration, green discoloration, invaded by a fleshy translucent growth with ramifying vessels, or bloody effusion with fatal hemorrhage. In all extreme grades, the cornea was opaque because of the proptosis. In some cases completely lost. The sclera has been pale, and in another case hemorrhages were found in the scleral tissue. The vitreous was only examined once, and was then normal. Subcutaneous hemorrhages were seen in and about the eyelids; chemosis, photophobia, tenderness of the eyeballs and pain in the eyes have all been mentioned. Loss of motility varied from the paralysis of a single muscle to total ophthalmoplegia.

Optic neuritis was present in at least ten cases; if the patient has lived long enough, optic atrophy has followed. Other conditions have been pale nerves, exudation in nerve head and hemorrhage into the nerve tissue. Numerous hemorrhages, from minute spots to large linear extravasations, have been noticed in the retina. The vessels have been described as pale, rosy or distended and tortuous; most often venous stasis is present. The outcome has been invariably fatal.

C. H. M.

ON THE INFLUENCE OF INJECTIONS OF BLOOD OF DIFFERENT SPECIES UPON MALIGNANT TUMORS.—BIER, AUGUST, Berlin (*Deutsche Medizinische Wochschr.*, 1907, No. 29, p. 1161). The report of experiments of von Leyden and Bergell to destroy malignant tumors by fermentative influences were for Bier the incentive to publish his investigations, begun in 1901, although they did not lead to practical results. Injections of defibrinized blood of the pig or lamb into man produce local inflammations and fever, but leave the normal tissues intact, not the pathological. If injected into carcinomata, the secretion and suppuration was very markedly diminished. Not one case was cured by these injections, but several were peculiarly affected. Two of them are reported.

A very hard, large carcinoma of the cheek of a man, aged 78, disappeared, under intense inflammatory infiltration and formation of connective tissue, almost completely after four injections of 10 c.cm. of blood of a pig, leaving a clean granulating surface, which, however, contained scarce carcinomatous tissue.

Case 2.—After two injections of 15 and 11 c.cm. of pig's blood into a hard carcinoma at the supraclavicular region of a man, aged 65, which had started from the thyroid gland, the tumor became almost totally necrotic and was easily removed with one grip.

Whether it will be possible to cure malignant tumors in this manner the author considers as doubtful. But the changes ob-

served invite to further experiments. Bier, however, dissuades from imitating his method on human beings, as it requires a certain technic in order to avoid damage, which will be published at a later date, after his views will be clearer. C. Z.

THE ORIGIN OF IRIS AND ANTERIOR CHAMBER CYSTS. —WOLFFLIN, ERNST, Basle (*Arch. Ophthal.*, September, 1907, xxxvi, 650), classifies cysts of the iris as follows: 1, Serous cysts; 2, solid cysts (epidermoidomata); 3, entozoa cysts; 4, dermoid cysts. He then gives the classification of serous cysts, as distinguished by the Vienna school, as follows: 1, Those which are entirely surrounded by iris tissue; 2, those which lie partly in the parenchyma of the iris, partly in the anterior chamber, cysts of the iris and anterior chamber (iriskammereysten); 3, those which lie entirely in the anterior chamber and the iris forms only a part of their boundary, true cysts of the anterior chamber.

The author mentions a case to demonstrate that cysts may occur which can not be placed in any one of the above groups, but may belong to all three. The patient had received a penetrating wound of the eye eighteen years previously, resulting in opacities of the cornea with adhesion of the anterior layers of the iris to the cornea in the lower inner quadrant, and in this part of the anterior chamber a cyst could be seen, filled with a transparent material and with a thin cyst membrane on its temporal and posterior surface. There was no vision in the eye and it had recently been painful. The eyeball was enucleated and microscopic sections showed two anterior chamber cysts developed from epithelial nuclei in the tissue of the iris, and their conjunctival origin was indicated by the presence of goblet cells. The author states that these cysts did not arise from a single epithelial nucleus, but from several which united by fusion of their walls of separation, and that they were not closed, but were connected with a cylindric space which ran nearly vertically in the region of the original wound in the sclera, which forms direct connection between the upper-inner part of the anterior chamber and the lower part of the posterior.

The author adds that "these cysts belong to no one of Wintersteiner's three groups, but possess characteristics which pertain to all three, inasmuch as they would at first have been designated pure iris cysts, later in their development cysts of the iris and anterior chamber, and, finally, cysts of the anterior chamber."

W. R. M.

VISION AND COLOR PERCEPTION

SOME OBSERVATIONS ON THE COLOR SENSE AND VISUAL ADAPTATION OF BIRDS. HESS, CARL, Würzburg, Germany (*Ophthalmic Record*, August, 1907), has made some experiments in an attempt to settle the question whether dark adaptation is a function confined to the retinal rods and whether cones are able to adapt for darkness or not. He found that hens fed only when they could see the grains. If allowed to feed with the grains scattered over a black ground so illuminated that the shadow of a thin lath falls on the middle of the lighted areas, the hen picks up all the grains on both sides of the shadow, but does not touch the grains upon the shadow. Experiments were made with the hen in a room and the illumination from one source and that controlled by an Aubert's diaphragm. The hen began at once to pick up the grain from the black ground and continued to do so until the illumination was reduced to a point where the human eye could no longer see the grains distinctly. If the hen and her observer remain in a completely dark room for an hour and the light is gradually let in, it is found that the hen begins to pick when the illumination is far less than in the former experiment. The observer also finds that he is able to see the grains distinctly at the same point at which the hen begins to pick. The same experiments conducted with pigeons give almost the same limits as for hens. These experiments prove that day birds, in whose retina rods are almost completely absent, show a very marked adaptation, the degree of which seems even to be not very different from that of the human eye. This indicated that adaptation must exist independently of the retinal rods. Owing to the presence in the retina of red and yellow fat balls in hens' and pigeons' eyes, it has been impossible to tell if the percipient layer contained visual purple. The author succeeded in removing the fatty globules with benzol so quickly that he was able to demonstrate that the hen's retina was nearly devoid of visual purple. In order to determine the color vision of hens, the author, by means of a mirror and an electric lamp of high power, projected on the floor an objective spectrum. This was spread over a black ground upon which wheat grains were distributed. The hens generally began to pick the red grains first and then the yellow and green grains, but the blue and violet grains they did not pick. The experiment shows that the hen sees the spectrum at the red end as far as we do, but at the other end it is much shortened. In order to imitate the action of the red and yellow fat balls upon the cones of the hen's retina, he placed before one of his own eyes a red glass

and a yellow glass before the other: he then found that he could only see the red end of the spectrum as does the hen. He explains this vision in the hen by the red and yellow fat balls acting as a screen between the two ends of the rods and believes that it proves that the outer segments of the cones are the perceptive ends, because if the reverse were true the hen would see as we do, who have no colored fat balls to screen out the blue and violet rays. M. B.

Book Reviews.

The Ophthalmoscope. A Manual for Students.—HARTRIDGE, GUSTAVUS, F.R.C.S., Surgeon to the Royal Westminster Ophthalmic Hospital; Ophthalmic Surgeon and Lecturer on Ophthalmic Surgery to the Westminster Hospital; Consulting Ophthalmic Surgeon to St. Bartholomew's Hospital, Chatam, and to St. George's Dispensary, Hanover Square, etc. Fifth edition. Price, \$1.50. P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia.

This fifth edition of Hartridge is beautifully printed and bound. Some additions have been made which certainly enhance the worth of the book as a guide to ophthalmoscopic work. The ophthalmoscope is now not alone necessary to the ophthalmic surgeon, but to the general practitioner, as any serious general diseases may first be detected by changes taking place in the fundus, frequently without any subjective symptoms. The subject is well covered by the text and is illustrated by four plates with sixty-eight illustrations in the text. It is acknowledged as the standard work on the ophthalmoscope and should be in the possession of every student and teacher.

II. V. WÜRDEMANX.

The Refraction of the Eye. A Manual for Students.—HARTRIDGE, GUSTAVUS, F.R.C.S.

This is a standard English work on refraction, passing through fourteen editions; 28,000 copies being issued, is one of the points which shows its value. In this edition the author gives the proper place and consideration to the objective method, page 78: "The estimation of the refraction by the direct ophthalmoscopic method is exceedingly valuable, but requires great practice; some observers find considerable difficulty in relaxing their accommodation completely, even after long practice." Page 79: "In hypermetropia and myopia one is able to estimate the amount of error actually, and in cases of astigmatism where the chief meridians are horizontal and vertical one can come very near the exact correction, and without necessarily subjecting the patient to the inconvenience of a mydriatic; when the meridians are oblique the estimation is more difficult, because we may find no vessel whose course exactly corresponds with the chief meridians. Still the more this method is practiced the more accurate will be the results obtained. The correction must always be confirmed by trying the patient at the test

types with lenses, making any slight alteration that may be necessary."

As regards retinoscopy, page 98: "One is often able to put up the cylinder in the spectacle frame with the exact degree of obliquity." After these methods the glasses are "assumed to be the right ones, and we proceed to confirm it by trying the patient at the distant type, making any slight alteration that may be necessary."

As regards the ophthalmometer, page 176, he states that "Scientifically it may be of much value, as by it we are enabled to separate astigmatism due to the cornea from that due to the lens; but the price will prevent its coming into general use, especially as we possess so many other methods by which astigmatism may be estimated; the separation of the two forms of astigmatism is a disadvantage, practically, when we are seeking to correct the defect." Page 178: "First, that the correction of corneal astigmatism by means of the lens in young persons is the rule; second, that corneal astigmatism amounting to one and a half dioptries is incompatible with normal acuteness of vision."

As regards the use of mydriatics, he gives the following, page 91: "Atropin should be used either in the form of drops or ointment. 1, In all cases of concomitant squint; 2, in hypermetropes under twenty; 3, in cases of defective vision under eighteen, due to myopia or astigmatism."

He gives a very good description of the treatment of squint, dividing it into three parts: 1, Optical; 2, training the vision; 3, operative.

We thus see that the book is thoroughly up to date. About the only criticism I have to make is in quoting the visual acuity; I believe it is best to give the enumerator in the Arabic type, whereas the denominator should be given in Romans.

Appendix containing the regulations for commissions in the army, navy, Indian Civil Service, Indian Medical Service, Public Works and English Railways is given. The index is sufficient to find the subjects easily. The work, as it has been heretofore, is highly commended.

H. V. WÜRDEMANN.

Transactions of the Section on Ophthalmology of the American Medical Association. 1907. Price, \$1.00.

This volume has grown greatly, now comprising 658 pages, including a complete index and list of members who have registered during the last five years. This is now published under the heading of states and cities, a most convenient classification.

There are thirty-eight essays, all of scientific importance. These essays have been or will be abstracted in our columns as they are published in *The Journal* of the American Medical Association.

H. V. WÜRDEMANN.

The Commoner Diseases of the Eye. How to Detect and How to Treat Them. For Students of Medicine.—WOOD, CASEY A., M.D., C.M., D.C.L., Professor of Ophthalmology, Northwestern University, Ophthalmic Surgeon to St. Luke's Hospital and Wesley Hospital, Chicago; Consulting Ophthalmologist to Cook County Hospital and Passavant Memorial Hospital, etc.; and WOODRUFF, THOMAS A., M.D., C.M., L.R.C.P. (London), Ophthalmic Surgeon to St. Luke's Hospital and St. Anthony de Padua Hospital, Chicago, etc. With 280 illustrations and 8 colored plates. 598 pages. Third edition. \$2.50. W. T. Keener & Co., Chicago, 1907.

Wood and Woodruff discuss the commoner diseases of the eye sufficiently to enable one who meets such conditions only occasionally to detect and treat them. The fundamental principles of ophthalmology are clearly elucidated and emphasized; it is only upon such a foundation that the practicing ophthalmologist can hope to acquire useful knowledge. The student whose studies of ophthalmology began with *The Commoner Diseases of the Eye* will never be without this text.

"It is not claiming too much, we are sure, of the student of medicine that he should have at least a fairly intimate knowledge of the eye signs and symptoms of disease in general. Chapters on this important subject have been carefully prepared and profusely illustrated, especial stress being laid upon those evidences of systemic involvement that the ocular structures so commonly exhibit."

"The importance of nasal and neighboring cavity affections of the eye has lately been recognized, and we believe the admirable chapter by Dr. Frank Brawley, appearing in this edition, will be fully appreciated."

SAMUEL G. HIGGINS.

Eye Strain and Eye Sight. How to Help the Eye and Save the Sight.—GRIMSHAW, JOHN, M.D., B.S. (Lond.), D.P.H. (Camb.), etc. T. A. Churchill, 7 East Marlborough street, London. Cloth bound. Price, 25c.

This is a small paper-covered book of 77 pages, in which in twelve brief chapters has been compressed a fund of information relating to eyesight and eye-strain. As the book is purposely written for the benefit of the general public, the author has set himself no mean task in endeavoring to teach of and about the eye and eyesight without overweighting his pages with technical terms and details which only frighten away those whom one would like to see read such works. The book ought to be made compulsory reading for all who have to do with children, especially school masters and mistresses. In itself the subject is a dry one and it is doubtful if

the author could have lessened its unattractiveness, and one fears that the only class who will peruse it will be the prescribing optician. Medical men unacquainted with eye work should certainly study it, as it will teach them many things. A. A. BRADBURN.

Medical Ethics a Guide to Professional Conduct.—SAUNDLEY, ROBERT. M.D., Edin.; Hon. LL.D., M'Sill Hon. M.Sc., Birm.; Fellow of the Royal Coll. of Physicians of Lond.; Member of the General Medical Council; Vice-President, late President, of the Council of the Brit. Med. Association; Emeritus Sen. Pres. of the Roy. Med. Soc.; Fellow of the Roy. Med. and Chir. Soc.; Member of the Pathol. Soc. of Lond.; Prof. of Medicine in the University of Birm.; Phys. to the Sen. Hosp., Birm.; Consult. Phys. to the Birm. and Midland Eye Hosp., and to the West Bromwich Hosp.; Late Examiner in Medicine to the Examining Board for England. Second edition, enlarged and rewritten. Charles Griffin & Co., Exeter Street, Strand, London.

The subject of medical ethics is perhaps the least attractive a subject, and one which is particularly open to criticism, of any other relating to medicine. No two members of our profession are of the same opinion regarding any but the simplest problem of social relationship and under such circumstances it is a pity there is no authority to appeal to when necessity requires.

Dr. Saundley's book is doubtless the nearest approach to such authority, and as it is frequently quoted in the settlement of disputes, time and custom will in all probability invest it with what it lacks at present, i. e., authority. No hard and fast rules can be expected to bear on the social relationship of medical men, but that there should exist a code of ethics such as this book endeavors to substantiate is evidently a necessity.

Criticism of the book as a whole has nothing but praise, but in regard to small details such would vary for agreement or the reverse, according to one's personal views. This is seen in the remarks on "Advantages of Partnerships," with which the reviewer totally disagrees, and notes that the author is not in partnership himself. The chapter on "Opticians and Eyesight Testing" is the one which will most appeal to ophthalmologists, and such will on the whole fully agree with the author in his remarks. The publishers have produced a work which is an ornament to any library.

A. A. BRADBURN.

Physician's Visiting List.—LINDSAY AND BLAKISTON. 1908. Price, \$1.00

A handy blank book with the usual additional printed labels.

H. V. WURDESSA.

Wellcome's Excerpta Therapeutica.—WELLCOME, BURROUGHS & Co., London (Eng.), New York, Montreal, Sydney, Cape Town, United States Edition. Gratis.

Some of the pharmaceutical publications of manufacturing houses are well worthy of retention in the physician's library, and this is one of them. With their productions are likewise included many therapeutic notes, suggestions as to diseases and treatment and of interest to oculists. On Page 282 and following are explanations of the use of test types and methods of paralyzing the accommodation.

H. V. WÜRDEMANN.

Merck's 1907 Index. An encyclopedia for the chemist, pharmacist and physician. Third edition. Merck & Co., 15 University Place, New York. Gratis.

This is one of the books published by the manufacturing houses which, though sent gratis to some of the members of the profession, is of great value to them for reference; it embraces 472 pages, with a complete index of drugs and fine chemical products. It is not a price list, but they give what is called "comparative values" in numbers after the preparation; for instance, the number after most of the common drugs, i. e., aloes, aloin, etc., is 1; after some of the rare and very high priced preparations (one of the highest noted is camellin 2500, a drug used in endocarditis and pericarditis instead of digitalin; digitalin crystallized Merck being 798; digitalin French Merck 1100; digitalin German Merck 140). The products obtainable of the Merck brand have the designation "Merck" put after the name.

H. V. WÜRDEMANN.

Toxicology.—BRUNDAGE, ALBERT H., A.M., M.D., Phar.D., Milwaukee. A concise presentation of the principal facts relating to poisons, with detailed directions for the treatment of poisoning. Also a table of doses of the principal and many new remedies. Fourth edition, revised and profusely illustrated. The Henry Harrison Co., Broadway and Gates avenue, New York. Price, with 10 colored plates, \$2.00 net.

This is a concise, well written and printed octavo, so well described by its title that description of the contents is unnecessary. The use of black-faced type for headings and principal sentences renders it easy of consultation in an emergency.

H. V. WÜRDEMANN.

Electro-Therapeutics and Röntgen Rays.—KASSABIAN, MIHRAN KRIKOR, M.D., Director of the Röntgen Ray Laboratory of the Philadelphia Hospital. Price, \$3.50

This book, as indicated by its title, presents clearly and concisely the more important facts in regard to the therapeutics and the Roentgen rays, and in my opinion it embraces all of the facts that

are necessary for a clear understanding of the subject. He has described the treatment and application of electro-therapeutics in its various forms in a comprehensive manner, and the book appeals to the practical physician in all its pages.

It is only recently that the oculists have had their attention called to the advantages of electro-therapeutics, and many of us are not only interested in the subject, but are using it in our daily work to the great advantage of our patients. Of especial interest to us in this work are pages 121, *The Treatment of Exophthalmic Goiter*; 134-136, on *The Application of Electricity to Ophthalmology*. Its use for paralysis of the muscles of the eye has been known for a long time. The author has commented and taken excerpts from the works of authors in our specialty. Crussel claimed to have perfect success in cases of cataract by the galvanic current, his methods being to introduce a needle into the lens, connecting it to the negative pole, the positive being applied to the tongue, the cataract being subjected to mechanical disintegration, chemical influences and to the aqueous humor.

The work of Lotine and others in regard to electrolysis in diseases of the lacrimal canal is reported. L. Webster Fox describes electricity in retinal anesthesia. W. Franklin Coleman reports miscellaneous ophthalmic affections, particularly optic nerve atrophy. The time taken for printing and publishing does not allow the author being within much nearer than a year to the reports in medical achievements and publication in special journals, and thus it is that he has not included the recent work of Würdemann and others upon the treatment of optic nerve atrophy.

Sweet's localization of foreign bodies in ophthalmic surgery is treated from page 289 to 298. The methods of Davidson, Sweet, and Grossmann are accurately described.

The treatment of malignant growths by radium and other radioactive substances is fully described.

The use of phototherapy is described on pages 510-517. On pages 520-521 the use of blue light as an anesthetic is shown.

An appendix, charts and a very complete index renders the work a most valuable one for reference as well as a guide in actual practice. It is highly commended not only to the general, but to the special practitioner.

II. V. WÜRDEMANN.

Operations on the Eye.—CZERMAK, PROF. DR. WILHELM. *Die Augenärztlichen Operationen.* Second enlarged edition. By Elschütz. Author, Professor and Director of the eye clinic in the German University of Prague. With numerous illustrations. Vol. I, first half, 326 pages. Urban & Schwarzenberg, Wien I, Maximilianstrasse 1. 1907. 10 M. \$2.50.

At the completion of this monumental work in 1904 (reviewed in *OPHTHALMOLOGY*, 1905, pp. 384 and 601), Wilhelm Czermak announced his intention to remedy, by supplement in a second edition, the absence of the more recent literature in the early parts of the book which was published in 1893. His untimely death, Sept. 11, 1906, prevented his seeing the second edition printed. The publication was entrusted to his well-known pupil and successor, Prof. A. Elschmig. However, the indefatigable preparatory work of Czermak for a new edition may be recognized by the numerous additions in brackets to the original text, which has been retained, while the supplements written by Elschmig are signed "E."

The present volume contains the general part on instruments, aseptics, operations and after-treatment, and of the special part, the operations on the lids and conjunctiva. Of the new matter inserted we mention: Operation lamp by Fuchs, new sterilizer of Grosse, substitutes for cocain, new methods of blepharorrhaphy and operations for entropium and trichiasis, modification of Kuhnt's operation for ectropium, according to Kuhnt-Szymanowski, detachment of the ectropic lid, operations for ptosis devised by C. Hess and Motais, advancement of the levator according to Elschmig, H. Wolff, paraffin prothesis in epicanthus, paraffin injections, Kuhnt's enucleation of the tarsus. Knapp's roller forceps is, however, only half the size of the illustration on page 34, an error taken over from the first edition.

The conclusion of the work is promised this year. The appearance in two volumes and the greater length of the printed lines will make the work much handier. Print and paper are very good. We would suggest that in the prospective numbers the contents be indicated by headlines at the top of each page, by which orientation will be greatly enhanced.

Professor Elschmig deserves special thanks to have made this excellent work, indispensable to every ophthalmologist, again rendered accessible in a modern form, the first edition having been sold out before it was concluded.

C. ZIMMERMANN.

Photography of the Fundus of the Eye.—DIMMER, F., PROF., Graz. 142 pp., with 53 figures in the text and 15 plates. Wiesbaden. J. F. Bergmann. 1907. 14 M. \$3.50.

This monograph is very welcome, as it gives, for the first time, a complete synopsis of all that has been done in photography of the ocular background from its initial stages up to date by an author who, having been engaged in these studies and experiments for the

last ten years, has brought the technic to the greatest perfection obtainable under present conditions.

The detailed review of literature commences with 1862, when Noyes made the first attempt to photograph the fundus of the eye of the rabbit, and gives the various methods with illustrations of apparatus.

Chapter 2 deals with the value of photography of the fundus and its difficulties and the means to overcome them. As the details visible on the background are generally seen under the same focus, they are favorable objects for photography, excepting detachment of the retina, choked disc, glaucomatous excavation. The lack of colors is not as important, as the changes of the fundus mostly appear in very intensely contrasting colors, which can be recognized in the photograph.

The chief advantages are: The instantaneous exposure gives absolute accuracy (which would otherwise require for a drawing many sittings lasting for hours), the possibility of easy repetitions of photographs, which is very important to follow the course of the disease, the exact reproduction of the vessels and their ramifications and the possibility of measuring distances in the photograph, as between the macula and disc, and of thus ascertaining the locality of a foreign body, etc.

The difficulties are the reflexes of the refracting media, source of light, adjustment, absolute rest, visual field and distinctness, equal illumination, color of the background, retinal reflexes, differences of level on the fundus. All these points are discussed in detail and how they are eliminated; the reflexes by the geometric method of Thorner.

Then the principle of Dimmer's own apparatus is set forth, followed by a description and illustration of his apparatus and its application, which requires only a few minutes, as all preliminaries can be performed by a skilful assistant.

Plates 1 and 2 are exposures made by other authors and by Dimmer before completion of his latest apparatus here described in chronologic order. The remaining 52 are reproductions of pictures of the fundus taken with his latest apparatus, and are selected so that, besides the normal fundus and congenital anomalies, almost all kinds of diseases of the background are represented, i. e., diseases of the retina, chorioid and optic nerve. Therefore, not only the best of Dimmer's whole collection are reproduced.

In some, especially in those taken from youthful eyes, the retinal reflexes are disturbing. White foci and hemorrhages are very dis-

net, while pigment spots are not as dark as seen with the ophthalmoscope. Bearing this in mind, one will readily recognize the pathologic conditions in the well-executed photogravures. The author's painstaking efforts in perfecting the methods of photographing the fundus of the eye will be thankfully appreciated.

C. ZIMMERMANN.

Optic Nerve and Accessory Cavities of the Nose.—ONODI, A., PROF., Budapest. Contributions to the doctrine of canalicular neuritis and atrophy of the optic nerve of nasal origin. 69 pp., with 33 illustrations. Wien and Leipzig, 1907. Alfred Hoelder. Wien 1. Rotenturmstrasse 19. 6 M. \$1.50.

The author, who by his elaborate works on the finer anatomy of the nose and its accessory sinus has become well known, gives here the results of his studies and researches, within the last ten years, on the relation of the optic nerve to the accessory sinus of the nose. They constitute the anatomic basis for the visual disturbances and blindness in diseases of the sinus, especially the posterior ethmoidal cells and the sphenoidal sinus.

The first part deals with the topographic anatomy. Onodi emphasizes that he demonstrated in his former publications the intimate connection of the optic nerve to the posterior ethmoidal cells and thus proved that the almost conventional assumption of the relation of the optic nerve to the sphenoidal sinus must be discarded. His further investigations revealed 38 varieties of the relations of the optic nerve to the posterior ethmoidal cells and the sphenoidal sinus. They are arranged under twelve chief types and described in detail, with photogravures of specimens of natural size. Then another series of anatomic observations of the author of practical and etiological importance, as they may have some influence on the visual disturbances in diseases of the sinus, are discussed under the following headings: Osseous wall of the optic canal and sulcus, dehiscence of the walls of the sinus, the ethmoidal semicanal, the common septa of the single sinus, the turbinated cell, so-called osseous vesicle.

The clinical part consists of casuistics from literature and Onodi's own observations. An exact anatomo-pathological basis has still to be created, and for this purpose the author advocates exact clinical and microscopic observations by combined rhinologic and ophthalmologic investigations.

Onodi's monograph is a most valuable and practically useful contribution to this important field. The external appearance is sumptuous and the many illustrations are beautifully executed and remarkably clear.

C. ZIMMERMANN.

The Changes of the Retina by Light.—GARTEN, S., PROF., Leipzig. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 119 to 121. 130 pp., with 49 figures in the text and 5 plates. Leipzig, Wilhelm Engelmann. 1908. Subscription 6 M. (\$1.50).

In these numbers the author gives an exposition of the microscopic changes of the retina by light, first the mutations of form and staining of rods, cones, exterior granules and pigment epithelium and then those of the conducting layer of the retina, i. e., the inner layers of fibers and ganglion cells. Since these alterations are very slight or scarcely noticeable in the higher species of animals, our knowledge being based on the observations on poikilothermic animals, particularly fishes, to which the author largely contributed by original investigations. He describes in detail his method, by which he ascertained the place of conversion of light into nerve excitation in the retina of the frog, i. e., the plane of the sharpest picture, while the retina was being viewed under the microscope from the surface of the rods. This would be about the plane of the *membrana limitans externa*.

Then the changes of the various parts of the cones, as the most certain and marked effect of light, are discussed and Garten's experiments on monkeys with regard to contraction of the cones are reported, which showed a difference of length between the inner portions of the cones of the retinae exposed to light and of those kept in the dark. The time necessary for maximal contraction of the cones, the dependence of contraction upon intensity and nature of light stimulus, the point of impact of the stimulus, the meaning of the contraction of the cones, and the action of light on the pigment epithelium, are the next topics, concluded with an attempt at explanation of all these metamorphoses in the external layers of the retina created by light.

It is most fascinating to follow the competent guidance of the author through this interesting chapter of such elaborate and minute research in the anatomy and physiology of the retina. The numerous illustrations are excellent. C. ZIMMERMANN.

Ocular Changes in Diseases of the Meninges.—UHTHOFF, W., Breslau. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 116 to 118. 206 pages, with 17 figures in the text and a colored plate. Leipzig. Wilhelm Engelmann. 1907. Subscription, 9 M. (\$2.25).

As external pachymeningitis is generally dependent upon affections of the skull, after traumatism, etc., and will be considered under these chapters, Uthoff commences, after general remarks on the occurrence, etiology and pathology of internal hemorrhagic meningitis, or hematoma of the *dura mater*, with the eye symptoms

in this disease. The chief affections are choked disc, either due to hemorrhages into the optic sheaths or analogous to that in tumors of the brain, with hydrops of the sheaths, and conjugate deviation of the eyes to one side.

Under diseases of the dura mater, thrombosis of the cerebral sinus is discussed, with four excellent anatomic pictures for orientation. Uthoff distinguishes between marantic, septic and otitic thromboses and enumerates their differential characteristics according to Macewen. Eye symptoms are much rarer in marantic than in septic thrombosis. Uthoff's statistics show about 16 per cent. of visual defects and changes of the fundus and about 33 per cent. of disturbances of motility.

They are more frequent in septic thrombosis, viz., about 20 per cent. pathologic changes of the fundus and visual impairment, due to venous hyperemia of the disc and retina, optic neuritis, choked disc, atrophy of the optic nerve. The direct lesions of the optic nerve were chiefly found in thrombosis of the cavernous sinus, partly with exophthalmus and edema of the lids. Thrombosis of the cavernous sinus developed either from the periphery (erysipelas, furunculosis of the face, etc.), or from the accessory cavities (upper portion of nose, frontal, especially sphenoidal, sinus, alveolar periorbitis). Exophthalmus is the most frequent eye symptom in septic thrombosis of the cerebral sinus. It occurred in 72 per cent. in Uthoff's statistics and in each of these cases the postmortem examination revealed septic thrombosis of the cavernous sinus. In most cases the process is propagated into the orbit by thrombophlebitis of the ophthalmic vein. A frontal section through the orbit closely behind the eyeball illustrates the thrombophlebitis of the orbital veins with exophthalmus in thrombosis of the cavernous sinus after a furuncle of the face. From these conditions of the orbit, especially if associated with extension of the frontal veins, optic neuritis and ocular palsies, the diagnosis of septic thrombosis of the cavernous sinus may safely be made.

In 54 per cent. of otitic thrombosis, pathologic ophthalmoscopic changes were found. Uthoff saw in about 18 per cent. choked disc and explains the higher percentage of others by the assumption that his distinction between choked disc and optic neuritis was not upheld. A large number of autopsies of cases with choked disc during life showed complications with meningitis, perisinuous and subdural abscesses, brain abscess and arachnitis. Only 25 per cent. of these were not complicated. The practical importance of these conditions with regard to treatment is duly emphasized.

Under the now following diseases of the soft meninges the eye symptoms in tubercular meningitis are exhaustively dealt with. They occurred in 50 per cent. of Uhthoff's material. Thirty pages are devoted to ocular affections in epidemic cerebrospinal meningitis, based on Uhthoff's and Heine's observations of 210 cases in the last epidemic of 1905.

Then follow ocular affections in otogenous purulent meningitis, meningitis after general infectious diseases, acute purulent meningitis without distinct etiology, chronic simple meningitis, diffuse meningitis caused by malignant tumors, serous meningitis and hydrocephalus.

The great value of Uhthoff's elaborate work lies in the large amount of original observations combined with a most thorough utilization of literature.

C. ZIMMERMANN.

Pathologic Physiology.—KREHL, LUDOLF, PROF., Director of the internal clinic in the University of Heidelberg. A text-book for students and physicians. Fifth revised edition. Leipzig. F. C. W. Vogel. 1907. M. 15. \$3.75.

The great merits of this unusually good work were set forth in our review of the fourth edition in *OPHTHALMOLOGY*, 1906, p. 175, to which we beg to refer. It is not to be wondered at that after a year another edition became necessary, displaying the incessant ambition of the author to keep the book abreast with the most recent progress. Thus it will be sure to win a still larger circle of friends.

C. ZIMMERMANN.

Handbook of Human Physiology.—NAGEL, W., PROF., Berlin, in conjunction with many collaborators. Volume II. With 213 illustrations and 3 plates. Braunschweig. Friedrich Vieweg und Sohn. 1907. Leather. 35 M. (\$8.75).

The importance and great value of this modern handbook of physiology was set forth in our review in *OPHTHALMOLOGY*, 1905, p. 841, of the third volume, which appeared first. Its chief object is, as indicated in the title, the physiology of man, and the physiology of animals has only so far been drawn upon as the latter serve in experiments as substitutes for man. A greater space is given to those chapters which are of most interest to the physician.

The second volume contains the physiology of the glands, of inner secretion, of the uropoetic, genital and digestive organs. A glance at the first chapter of 45 pages by H. Boruttau on "Inner Secretion" reveals at once the great progress of physiology within the last 25 years, as in the then standard work of Hermann only a few words were devoted to this subject. After general remarks on inner secretion, by which is meant the secretion of substances of

nutrition and assimilation into the blood and their influence on metabolism, the histology and physiology of the thyroid gland, hypophysis and suprarenal capsules are discussed, their extirpation and reimplantation and their consequences, injections and feeding of the glands and their active principles, the chemism of their functions, the inner secretion of thymus, spleen, pancreas and kidneys, testicles and ovaries and the secondary sexual characters dependent upon them. The discussion is based on the historical development of the facts arrived at and of the various theories, giving a most exhaustive exposition of this topic, also with regard to pathology (myxedema, etc.).

In the same manner the following chapters are treated: Physiology of the Male Sexual Organs, by W. Nagel; of the Female Sexual Organs, by H. Sellheim; Excretion and Evacuation of Urine, by R. Metzner; Urine, by O. Weiss; Excretion of Sebum and Sweat, by R. Metzner; Physiology of the Liver, by E. Weinland; Physiology of Digestion and Absorption, by O. Cohnheim; The Work of the Digestive Gland and Its Mechanism, by I. Pawlow; Mechanism of Absorption and Secretion, by E. Overton; Histological Changes of the Glands During Activity, by R. Metzner. In all these chapters, written by authors who by original researches have become famous in their respective fields, we have to admire the greatest completeness with due and critical consideration of various views, history of research and an abundance of references, including the most recent literature and enabling the reader to pursue his studies still further.

The external appearance, paper, print, the numerous illustrations and plates and binding are of superior quality. Nagel's handbook supplies an actual demand. It is the most exhaustive, authoritative work representing the present state of physiology, which deserves the widest circulation.

C. ZIMMERMANN.



Syphilitic Arteritis with Optic Atrophy
Posey and Krauss.

OPHTHALMOLOGY

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REPORT OF THREE CASES PRESENTING OCULAR MAN- IFESTATIONS OF TERTIARY SYPHILIS IN COLORED SUBJECTS.

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CASE 1. *Syphilitic Arteritis of the Retina with Optic Atrophy.*
—A. H., a colored woman, 42 years old, came to the Ophthalmic Department of the Howard Hospital on Oct. 30, 1907, on account of poor sight, from which she had suffered for a year or more. The loss of sight, which had been without pain in the head or eyes, had come on gradually, she thought, after a heat stroke fifteen months previously. A year prior to that, however, she had complained of feeling generally weak. Menstruation ceased one year ago without complications. It was elicited that she had had five brothers and seven sisters. Of these, three brothers and five sisters died in early infancy. The remaining brothers and sisters are generally well. Both father and mother are dead, of unknown cause. The patient was married at 14 years of age, and four years later her husband died of unknown cause. The issue consisted of three children, of whom two are living and well, the other dying when aged 2 years of probable pulmonary trouble.

Upon examination, vision was reduced to counting fingers in the right eye at 12 inches and in the left to 1/1xx. The pupils were 3 mm. in size and reacted rather sluggishly to light and convergence stimuli.

The ophthalmoscope showed an advanced degree of retinal arteritis with secondary atrophic changes in the retina and optic nerve, which are well shown in the accompanying water color, which was sketched from the right eye by Miss Washington.

The retinal arteries in both eyes are much reduced in size, especially in the neighborhood of the disc, where they appear like mere threads. They are covered with a grayish white opacity which entirely obscures them at times, and are cord-like and shimmering and resemble silver wires. The veins are but little reduced in size, but are accompanied in places by lateral white lines, which indicate that they, too, have not escaped the vasculitis. Numerous yellowish white dots in the papillo-maculary region of the retina of both eyes mark the seat of old hemorrhages. In the right eye there is a small round hemorrhage, not far from the disc, which has appeared since the case has been under observation.

Both optic nerves are in an advanced stage of consecutive atrophy, presenting a dull, chalky-white filled-in appearance. There are several small newly-formed corkscrew-like vessels on the head of the right nerve.

The ophthalmoscopic findings are evidently due to an unusually pronounced syphilitic disease of the retina and optic nerve arteries, and resemble in some particulars the changes seen in a case of vasculitis and perivasculitis reported by de Schweinitz at the last (1907) meeting of the American Ophthalmological Society. Unlike his case, however, there are no nasal complications, for an examination of the rhino-pharynx which was made by Dr. Geo. B. Wood showed that region to be free from disease. There are also certain points of resemblance with a case of perivasculitis retinae reported by Oliver at the same session. Vessels showing less pronounced changes are depicted in Gower's and Haab's atlases.

The changes in the blood vessels in this affection may be present a long time without occasioning retinal symptoms. As the process in the retinal vessels occurs as a rule simultaneously with endarteritis obliterans in the cerebral vessels, Schöbl¹ has suggested that the ophthalmoscopic examination is of great semeiotic importance for the general practitioner.

According to the same author,¹ Schelling in 1870 was the first to observe the ophthalmoscopic picture of this affection.

Syphilitic arteritis of the retina must be distinguished from syphilitic perivasculitis, or better, syphilitic periphlebitis of the retina. A case of this affection described by Scheffels² occurred in a man 18 years old, the subject of inherited syphilis. Ophthalmoscopically, the optic nerve was hyperemic and the veins were enlarged and tortuous and surrounded by dark, brownish-red hemorrhages. The arteries and retina appeared normal.

According to Parsons,³ "Hutchinson and Bader (1858) made the first histological examination of vessels diseased by syphilis, and this was followed by Edmunds and Brailey (1880). The latter

1. Norris and Oliver, iii, p. 487.

2. Archiv. für Augenheilkunde, xxii, 1891, p. 374.

3. The Pathology of the Eye, vol. ii, 615.

found thickening of the walls of the vessels and infiltration around them; there was no sign of proliferation. Nettleship (1886) noted increase in the nuclei in the walls of the smaller vessels; the adventitia of the arteries was thickened, sometimes hyaline; the muscular coat was scarcely recognizable, so that arteries could only be distinguished from veins by their greater thickness; there were groups of cells with deeply-stained nuclei in the adventitia and around the vessels. In some vessels, probably veins, only the inner layers were thickened. Holmes Spicer described similar changes. Uthoff found infiltration of the adventitia of the veins as well as of the arteries, and the aggregation of cells was sometimes so great that the lumen was invisible. Appel described annular and partial endoarteritis and periarteritis, slight infiltration of the adventitia in the veins and obliteration of many of the capillaries. Bass noted that where the vessels had pigment around them these were most sclerosed. The obliteration of some of the vessels leads to dilatation of the others in the same area."

CASE 2. *Cerebrospinal Syphilis, with Complete Palsy of Left Oculomotor and Trochlearis Nerves. Rapid Improvement of Ocular Palsies under Anti-Syphilitic Treatment.*—J. H., colored, a laborer, 32 years of age, was sent from the Neurological Department of the Howard Hospital for an ophthalmological examination, April 22, 1907, with a possible diagnosis of myelitis or syringomyelia. The patient confessed to a chancre four years previously, which had been followed by secondaries, and said that he had been under Dr. Rhein's care for a month or more for pain in his back and loss of feeling and power in his right leg. The ocular examination was negative. On Nov. 2, 1907, he again reported at the clinic, on account of double vision, which had appeared five days before. Examination showed complete left iridocycloplegia, with weakness of the left internal rectus muscle. The right eye was unaffected. When seen a week later it was found that the palsies had spread, there being now complete paralysis of the external part of the third nerve as well as the internal. The trochlearis was also involved. The fundi were normal and vision and fields were unaffected. The potassium iodid and mercury which he was taking were pushed and in a week the ocular symptoms had greatly improved, the ptosis having practically disappeared, and there was marked return in the action of the palsied extraocular muscles. This improvement still continues. The nervous phenomena elsewhere, however, remained unimproved. Dr. Rhein reports "on the right side the entire foot is anesthetic, outer and posterior cutaneous surface of leg anesthetic; area about three inches wide posterior aspect of the cutaneous surface of thigh anesthetic. Sensation to heat and cold abolished in this same area."

CASE 3. *Complete Third Nerve Palsy with Cessation of Head Pain, Simultaneously with the Appearance of Double Vision.*—A. A., colored, age 50 years, a seamstress, was referred to the Ophthalmological Department of the Howard Hospital by Dr. Rhein, Sept. 16, 1907, on account of persistent pain in the occipital region, which had been almost continuous the previous eight months, though somewhat intermittent a few weeks before examination. Glasses had been worn for ten years for near use, but other than an attack of heaviness of the left lid, which was unattended by inflammation and which persisted for about a week, the ocular history was negative.

Examination showed a low grade neuro-retinitis in both eyes, with a few fine opacities in the right vitreous. Uncorrected vision equaled 5/xxii in each eye. All ocular movements were normal, except for some deficiency in convergence. Refraction was advised, and mixed treatment prescribed, but the patient did not return to the clinic again until November 8, when she sought relief from a paralytic affection of the left eye which had seized her a week previously. Examination showed complete palsy of the left third nerve, both the external and internal branches being implicated. Dr. Rhein was unable to find other evidence of disease of the nervous system. The fields were normal.

The chief interest in the case centered in the sudden and complete disappearance of the head pain with the onset of the palsy, the transference of the symptoms from the occiput to the eye being in apparent connection.

The patient is doubtless luetic, though secondary symptoms are denied. She has had eight children, three of whom are dead. She has also suffered three miscarriages.

Isolated paralyses of the eye muscles are not infrequently the first symptoms of syphilis. They may be caused either by neuritis and perineuritis of the nerve roots either at the base of the brain or in the orbit, or they may have a nuclear origin. Probably at least half of the cases of ocular paralysis are due directly to syphilis and occur in the later stages of the disease. Although none of the extraocular muscles are exempt, Knies⁴ is authority for the statement that the motor oculi is affected in about three-fourths of the cases, whereas the abducens is involved in about one-fourth, the trochlearis in about only 1 to 2 per cent., and the facial with equal rarity. When the two latter nerves are paralyzed there is usually a simultaneous involvement of the motor oculi or abducens. The paralysis often develops very suddenly and headache and anesthesia or neuralgia along the branch of the fifth nerve is not uncommon. Its course often varies, being at times stationary for a protracted

4. The Eye in General Diseases, p. 415.

period; sudden variations are not uncommon, however, and total disappearance may occur, under which circumstances recurrences are rare. According to Fournier,⁵ however, syphilitic palsy is not so apt to be transitory nor so apt to be limited to single muscles as in the case of tabic paralysis. Naunyn⁶ observed 70 per cent. of recoveries, but according to this writer there is no hope of recovery if evidences of improvement do not appear after vigorous treatment for two weeks. This observation is of great value regarding the later treatment and indicates the correctness of Callan's assumption that we too often needlessly postpone operative interference in such cases.

In connection with syphilitic third nerve palsy, Bernheimer⁷ dwells upon the importance of early recognizing disturbances in the ciliary muscle and iris, as he believes that they are not infrequently the earliest manifestations of syphilis in the system. He contends that once recognized, energetic syphilitic treatment should be inaugurated, and in many cases the disease, which would otherwise result in extensive lesions in the cerebrospinal system, will be thoroughly eradicated.

5. Duane, in Posey and Spiller, p. 231.

6. Knies, *loc. cit.*, p. 415.

7. Grafe-Saemisch, 2nd Edition, 39, p. 14.

THE CENTUNE SYSTEM, THE PERCENTAGE OR NOMENCLATURE OF ANGLES.

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Reluctantly, while revising the last edition of my book on prisms, I was made to feel the necessity of a new nomenclature for angles to introduce order into what was previously rather disconnected.

It is only fair to mention that the idea grew out of the prism-diopter and the centrad. These units find their place in the new system in which they are more correctly named and classified, but the system, being an expansive one, permits other unit angles to find their place in it also, as different branches of science may require.

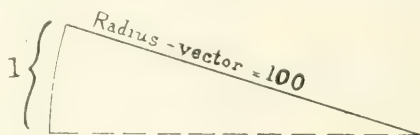


Fig. 1. Arc-centune.

I have suggested the name *centune* as that of the new unit-angle. It is defined as an angle subtended by a line whose length is one hundredth of the distance of its origin from the vertex of the angle. The line may be an arc, or possess a parabolic, hyperbolic or any other defined curvature, or it may be a straight line bearing any given relation to one or other limb of the angle.

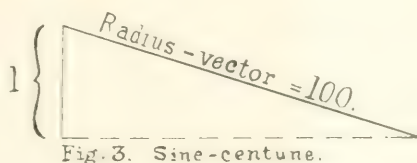
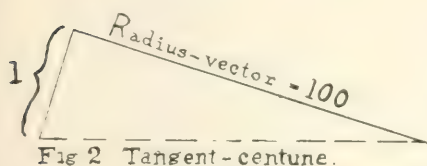
It will be at once seen that the centune is a generic unit, since though fixing the length it does not fix the nature of the subtending line, which may be of any specified variety. It is, in short, a 1 per cent. unit, and angles can be described in percentages if preferred.

The object of this paper is not to advocate the adoption of the new system, but only to endeavor to make its nature clear in order that it may stand or fall on its merits.

The subtending line of a centune may be the arc of a circle whose center lies at the vertex of the angle, with radius one meter; it is then an arc-centune.

Or it may be a straight line erected perpendicularly on one limb of the angle from a point a hundred times further from the vertex than its own length. It is then a tangent-centune.

Should, however, the subtending 1 per cent. line be dropped perpendicularly upon the other limb, the angle is a sine-centune. a unit now proposed for the first time, which may prove to be of service in geometrical optics, where sine ratios prevail. With any transparent medium exposed to light, the angle of incidence and the angle of refraction are to each other as the refractive index, if angles be measured sine-centunes. Moreover, for the study of the meter-angle, the only perfect unit is the sine-centune, since the meter distance is not measured in the median plane of the head, but obliquely from each eye to the point of fixation in the median plane. The meter-angle, therefore, contains as many sine-centunes as there are centimeters in half the distance between the centers of the two eyeballs (see Fig. 4).



Railway gradients, if expressed in the percentage system, would also be in sine-centunes. A gradient which rises one foot per hundred is a gradient of one centune; a rise of one foot in fifty is a gradient of two centunes, etc. (see Figs. 5 and 6). Owing to the manner in which the gradient is measured, the sine-centune is the species for that purpose, since the hundred feet are measured on the slant while the rise is measured as perpendicular. A sine-centune is a rather larger unit angle than an arc-centune and that again is larger than a tangent-centune. The diagrams, though enormously exaggerating the angle, are proportionately correct. To make a protractor for sine-centunes is extremely easy. A sheet of celluloid cut to the shape of a right-angled triangle need only have a millimeter scale marked on one or both of the edges adjacent to the right angle. When two dots are made on the paper, ten centimeters apart, the right angle need only be passed in between them till one edge touches one dot while the other edge meets the other dot at the proper millimeter mark, each millimeter representing one sine-centune. Then the angle between the other edge (adjacent to the right angle) of the protractor and the line joining the two dots encloses the angle required.

When we open a pair of dividers so that their points shall include a distance one-hundredth of the length of each leg the angle between the legs is a chord-centune. A chord twice as long would subtend an angle of two centunes and so on. This unit is only mentioned as an illustration of the flexibility of the centune system.

With regard to the decentration of lenses, it would not be just to forget the excellent work done by Mr. Charles F. Prentice in connection with the prism-diopter which was the first attempt to introduce a meter unit into the domain of prisms. The prism-diopter (or tangent centune, as it would be called when given its place in the centune system) is not, however, quite as accurate a unit for the decentration of lenses as has been supposed, owing to

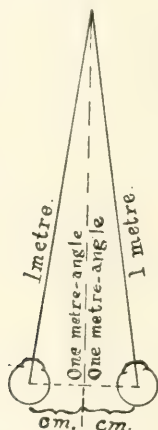


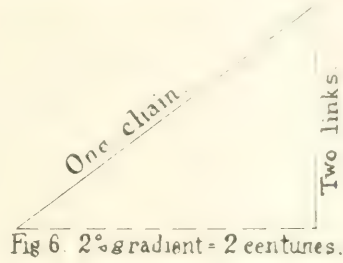
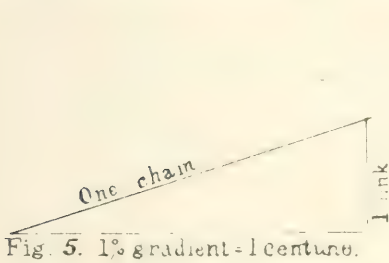
Fig. 4. Shows how one m. a. contains as many sine-centunes as there are cm in half the interocular distance.

no account having been taken of spherical aberration. The radius of the pupil is so small that we rightly ignore its effect on the nature of a pencil of light which fills the pupil. But when it becomes a question of the deflection of that pencil as a whole by decentration of a lens, as much as one centimeter, for example, the effect of spherical aberration can not be neglected in any accurate investigation. A ray of light incident on a lens in a direction parallel with the principal axis is deflected by an angle greater than one prism-diopter (see Fig. 7), so that it intersects the principal axis at a point nearer the lens than the principal focus.

Continuing on its way, it meets the focal surface at a certain distance from the principal axis, a departure which is called "lateral

aberration." This lateral aberration is in a direction which points toward the arc-centune as being rather truer than the prism-diopter, since it is a slightly larger unit-angle and does not decrease in size like successive prism-diopters do.

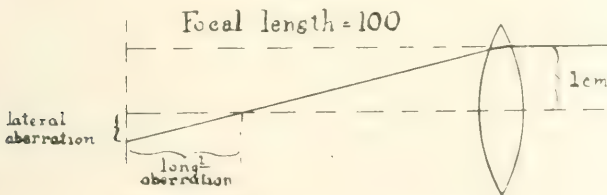
In contrast to the gradual diminution in the size of the angle in successive prism diopters, when a lens is decentered, each increment of decentering produces a more than proportionate increase of



spherical aberration, so that the arc-centune fits it better, though, of course, no existing unit fits it perfectly, and it would not be worth while to construct an elaborate one for the purpose.

This consideration should help to endorse the decision of the American Ophthalmological Society in favor of the centrad, which is here called the arc-centune, as the best unit for the numeration of prisms.

The measurement of prisms by wall scales, which I introduced in 1886, still remains the best clinical method for the measurement



of their deviation, and it is well to have the scales marked both in degrees and in arc-centunes.

Tangents of arc-centunes being projections of arc-centunes on the flat, are quite different from tangent-centunes, and, indeed, the former become progressively larger on the scale.

In ophthalmic practice the amount of decentering practicable is so limited that the difference between arc-centunes and tangent-centunes is quite insignificant, and the name centune alone, or its

equivalent mode of expression in percentage of deviation, is quite legitimate, manufacturers being free to treat it either way.

The interesting observation which I published some twenty-three years ago, that the effect of a prism on the fixation line when combined with a lens, truly centered in front of the eye, differs from the deviation of light by the prism, introduces another complication into this department of work, so that we may well describe prisms merely by centunes, or, in other words, by the percentage of their deviation, without further specification. Thus a 2 per cent. prism is one which deviates light 2 centimeters per meter.

The different species of centune enable us to be as accurate as we please in any case which calls for complete accuracy.

INSUFFICIENT PIGMENTATION AS A CAUSE OF EYE DISEASES.

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Medical literature is now full of data proving that the shorter rays of sunlight, particularly the ultra-violet, have essentially the same lethal effects as Roentgen-rays and those emitted by radium. Unprotected protoplasm is invariably killed by exposure to the sun, and we have long used this means of destroying pathogenic organisms, but we have been so completely imbued with the false idea that man himself needs the vivifying effects of light that the profession does not seem able to realize that the rays can do any harm except to bacteria. As a matter of fact, all animals are protected from the light. They either hide in the daytime or they are covered by hair, feathers or an opaque pigment. Even plant cells must function in the dark under the bark. Those in the leaf, concerned in the work of absorbing and breaking up the carbonic oxid of the air by means of these destructive rays, are also protected from harm by the green pigment or hairs, and if the light is too strong and they can not escape to the interior of the leaf or turn its edge to the rays they, too, are killed. It seems that the long waves—infra-red—are only capable of increasing the thermic movements of molecules, and that the short waves, from violet up through the ultra-violet, can not move the huge bulky molecule, but do set up intramolecular motions of the atoms, which at first stimulate "vitality" and then paralyze and, finally, if strong enough, actually disrupt the molecule—the true actinic effect. Without a single exception, living tissue is so placed as to receive sufficient infra-red vibrations and be protected from excessive ultra-violet ones.

As long ago as 1894 these facts were used to prove that man also needed protection, and that by the ordinary laws of selection of the darker types and destruction of the lighter a race became pigmented in direct proportion to the intensity of light—a law true in hot Africa or cold Greenland. This process is going on in America, right under our eyes, yet the medical profession has been unable to see it, though it has been known to a few anthropologists for many years. The whole matter is discussed in the book, "The Effects of Tropical Light on White Men," and the conclusions therein are

being gradually accepted by those who have studied the data in the tropics. It is high time that we acknowledge the facts, for we are doing an enormous amount of harm—so much, indeed, that it amounts to a scandal—yet every time the subject is mentioned there are vigorous denials. Take, for instance, the subject of tuberculosis. For a long time it has been known that in the heat and light of the tropics the infected promptly perish and that they must be hustled off to cold, darker climates. Only recently Knopf, of New York, has called attention to another long-known fact: the tuberculous in the northeastern part of the United States improve little, or not at all, in the light, hot summer, but that cures are accomplished in the dark, cold winter. Moreover, in the darkest, coldest places—the Adirondacks—the results of outdoor treatment are the best. It is also known by those who have investigated the matter that in the sunshine treatment the brunets show better results than the blond or yellow-haired, blue-eyed types, which have but little pigment protection. The latter are healthiest in the dark and cloudy northwest corner of Europe, but invariably perish in some generations if they migrate too far south.

There is scarcely a physician who realizes that the hair of the head is arranged over the cerebral cells to keep them shaded. Nearly all the races in hot countries supplement the natural protection by means of elaborate head dresses, and survive because they do this. Americans in the Philippines not only affect a contempt for such protection, but foolishly expose their heads to the light, and then complain childishly of the resulting tropical neurasthenia with mental weaknesses. If exposure is too great, one of the myriad forms of sunstroke is the result.

In spite of all these well-known facts there are only two phthisiotherapists, Burton-Fanning and White, who have had the courage to oppose the medical profession. In his work on "The Open-Air Treatment of Tuberculosis" (page 96), the former calls attention to the harm done to patients by the sunlight in summer and advises placing them in the shade. White mentions the damage done by light baths. All the rest without a single known exception advocate the maximum amount of unstinted sunshine, and send their patients to the southwest in winter to run away from the very conditions of cold and darkness which cure them. It is really awful to contemplate the slaughter due to this advice, which is the very opposite of what the facts prove should be given.

The profession must wake up to the fact that pigmentation is evolved to protect the underlying delicate living protoplasm from

the lethal effects of sunlight, and particularly the short rays—violet and ultra-violet. In every part of the world Nature has been weeding out the unfit and has permitted the survival of the types sufficiently protected in each locality. It is our duty to find out how she does this; that is, we must determine what diseases in light countries afflict the very blond to a greater extent than the brunet who are sufficiently protected. Of course, in Scandinavia and the northern part of the British Islands and around the Baltic, blond types are perfectly healthy and have been so for untold thousands of years. Blondness of itself is not evidence of a weak constitution, but if that type wanders into danger it is weakened thereby and suffers in time. That is why we look upon it as a tuberculous type, merely because more of them are affected in this sun-cursed land than are the better adjusted brunets or even the negro who does not destroy his resistance by unhygienic living.

Nevertheless, physicians in recording their morbidity statistics in any disease very rarely take the slightest note of complexion. If they had done so, we would now know what diseases are really wiping out the blonds from the American population, which from the survival of the darker types has already become quite brunet, even in places where blonds once predominated, as in New England. In Canada about three centuries ago, it is reported by La Hontan that there were few brunets among the French women, but now the conditions are reversed. Something has killed off the blonds, and that something is the lessened resistance which causes a greater mortality from about every disease which attacks both types indiscriminately. Not only is tuberculosis more prevalent among blonds in America as a result of this lessened vitality, but all those nervous conditions grouped together as neurasthenia—a disease woefully prevalent in white men both in the tropics and the snow glare of the arctics. This disease, by the way, is also best cured by residence in cold, dark climates, but made worse in the lands of perpetual sunshine. The autumnal migration of consumptives and neurasthenics to the southwestern health resorts not only takes them away from the dark conditions which cure them, but actually destroys many who would otherwise recover.

The poor suffering albino, who has no protection whatever in any climate, is constantly bombarded by light rays, and not only suffers from numerous complaints due to the astigmatism from lid pressure, but in a few years succumbs to some intercurrent infection and rarely, if ever, attains old age. He merely exaggerates what is found in a minor degree in the blonds who have insufficient

pigmentation and whose elimination is making this a nation of brunets, especially the city dwellers.

The ophthalmologists, more than any other class of physicians, should take up these new ideas and apply them to practical therapeutic use in all those diseases which investigations may show to be more prevalent and severe in blonds. This paper is written with the main purpose of calling attention to the fact that the pigments of the iris and inner coats of the eye have an important use which the text-books do not dwell upon sufficiently, if they mention it at all. That use has no relation to vision whatever, but is merely the same as that of the skin and hair pigments, to preserve the vitality of the cells which are made asthenic or killed outright if light is too strong. When the external light is excessive, as in the tropics, the pigment may be even deposited in the sclerotic, as we often find in the negro. If the climate is cold as well as light, as in the snow fields of the north, the lids open to a mere slit to admit a thin ribbon of light, and the lids themselves are puffy with fat to protect the eyeball from cold—extra precautions found in our Eskimo and in the northern Siberian and Russian tribes. Gould has enumerated at least a dozen different and distinct mechanisms which shade the eye. Hence there must be a long list of eye diseases in light countries which afflict the blonds to a greater degree than the better protected brunets.

Take the question of nystagmus, which is universal in albinos and very common among miners. Why is it that we say that it is caused by excessive light in one case and darkness in the other? Diseases are rarely caused by opposite conditions. To be sure we can kill a cell by heat or cold, but a disease produced by one factor, light, is not likely to be caused by the opposite. It is more likely that the surface glare is one factor in miners whose eyes are adjusted for many hours a day to seeing in a very dim light. If darkness is the cause, then we should all suffer as a result of darkness we endure every night. I have been informed by a professional man whose blond son has nystagmus, and who naturally has investigated the matter for years with a view of curing his son, that every case he has found was in a blond. I have found nystagmus in the blue-eyed types of half-breed Filipinos, far from albino, though they are called albinos on account of their contrast to the dark full-blood. Why not settle the matter at once by starting an extensive collection of statistics, recording pigmentation according to some scale, such as ten for the swarthy brunet of the Mediterranean and one for the yellow-haired Aryan type—the albino being

zero? If it is found that nystagmus affects more blonds than brunets we have the prevention in our hands. Of course, in miners the disease may affect any class, and it might be possible for a brunet to suffer most as a result of the greater strain of seeing in a dim light. Perhaps nystagmus is a reflex attempt on the part of the eye to relieve the retina from light pain by preventing light being concentrated on any spot for more than an instant.

Photophobia also must be re-examined in view of these revelations as to the harm of the shorter rays. The pain may be a symptom of some organic harm. —

I have also found that some cases of severe "headache" in the tropics are due solely to the excessive light, more severe in blonds than brunets, and that it disappears as soon as proper protective measures are instituted. In this climate, it is well to determine whether these distressing cases are not more numerous in the blond, for my observations lead me to believe they are. If so, a method of cure is evident.

It is an axiom of biology that the body is so plastic that any irritant—mechanical or chemic—if constantly applied, produces profound alterations. The bone erosions of aneurisms and the necroses in *x-ray* operators are instances. The *x-ray* atmosphere also causes profound nervous symptoms, and it is a further and more important fact.

William Thompson and Weir Mitchell, a third of a century ago, called attention to the migraine with profound nervous sequelæ due to the constant strain of obtaining accurate vision in slight ametropia. Since then scores of physicians have reported the same, and the enormous mass of evidence collected by Gould, of Philadelphia, is so overwhelmingly convincing that it can no longer be doubted that most migraines are due to eye-strain, and that there are deplorable nervous sequelæ even to the point of epilepsy, and that it all may cause an inefficiency which is the reason for much truancy and crime in persons unable to work because unfit for the strains of civilization. Now the point of the matter is that astigmatism causing eye-strain is generally due to lid pressure. As few Americans are sufficiently pigmented for this sunny land, it is evident that we all tend to close the lids abnormally, and it fully accounts for the fact that slight astigmatism thus functionally caused and its terrible eye-strain sequelæ are more common than in Europe. Moreover, the "nervousness" characteristic of Americans, not found in Europe where the populations are properly pigmented, renders the nervous system more susceptible. We have, then, far

more eye-strain and nervous cases than in Europe, where they do occur in plenty all the same, but the European profession can not realize their importance or etiology.

Now it is known that eye-strain cases often get worse when they travel south—say to Florida—and that amber-colored glasses, which cut out some of the irritating red and violet, are far more successful than smoked glasses, which by excluding the visual yellow rays only increase the strain of seeing. It is quite evident that all these cases should be found more often and severe in blonds than in brunets, the nagging of excessive light adding insult to injury, and often perhaps being at the basis of the lid pressure causing the original astigmatism which, in turn, causes the eye-strain and other terrible sequelæ.

Then there is the great question of the pigmentary diseases of the retina and chorioid, which are said to be more common in light countries than the dark ones. The effect of an irritation on any cell is at first an increased activity. If the cell is a pigmentary one, it makes more pigment, of course. Dermatologists recognize old stains as the signs of some previous irritation. Sunburn has long been known as a similar stain, due to irritation of the actinic rays, chiefly the ultra-violet. In the case of fair skins, this pigmentation is liable to form in spots and produce the familiar freckles which are thus evidence of more or less injury to the pigment cells. Such cases are quite numerous here in America and, as far as known, are not the rule among similar tow-headed boys in Scandinavia, where the light is not strong enough to cause it.

Reasoning from analogy, it is quite evident that pigmentary deposits in the retina and chorioid differ in no respects from similar skin stains and are due to some inflammatory process from any one of the dozens of well-known causes. The new point is the fact that one of these causes is an undue amount of light against which the coats are not sufficiently protected. For instance, the well-known pigmentary conditions (chorioiditis) of owls and other nocturnal animals exposed to day glare in our zoological gardens can have no other cause. I have found similar conditions in a white man as a result of living in the Philippines, and also in one who had been exposed to a great light in heliographic signal work. Consequently we should find all such diseases more common among blonds than brunets in the United States, particularly in its southern parts. Perhaps it will be found that the chorioiditis said to be due to chronic malaria may have a similar cause. It is with the

purpose of begging complexion statistics in all such cases that these speculations are submitted for consideration.

The eye, then, is pre-eminently one which should show damage by excessive light in its ordinary daily use, for it is flooded with light, which is concentrated to a focus by the refractive media. As a guard against damage, it is not only pigmented to a sufficient degree in the aborigines in each climate, but in every man there is a complex reflex apparatus to draw the curtain to exclude excessive amounts. It is generally taught that this regulation of the light is for the sole purpose of admitting just enough for vision and no more, but, as before mentioned, it must serve the more important purpose of protecting the protoplasm of the optic nerve endings. If so, we should find many functional and organic troubles in the blonds in southern latitudes resulting from their inability to exclude excessive light.

It is said that the retina is as susceptible to *x-ray* as are the germ cells of the testes or ovaries. If so it should be more susceptible to damage by light than the somatic cells, for the germ cells are also more injured by light than the somatic cells. Therefore, we can have a host of abnormal destructive conditions all the way from optic neurasthenia to optic nerve atrophy.

It is now proved that the first effect of light which is not too strong to be lethal is stimulating, and the nerves so treated are hyperesthetic. In larger doses, there is a well-proved anesthesia, which has often been used in minor surgery. The same results must occur in the retina, and are fully competent to explain some functional troubles, amblyopias, strains, etc., which my limited observation has shown me to be more common and severe in blonds than in brunets. Even atrophy of the retinal fibers and end-organs could be caused by excessive light, and account for some cases of optic nerve atrophy.

I regret my inability to supply definite statistics to prove these facts; I have not been able to collect them, as there are none on record in our clinics, but I trust that each ophthalmologist will hereafter record in his case book the color of the hair, iris, and the degree of pigmentation of the skin, according to some definite scale. It often happens that the skin is nearly white from absence of pigment, and yet the hair is very dark or black, the iris brown and the retina also well pigmented. Consequently such cases should not show the same morbidity as to eye diseases as to those of the nervous system. On the other hand, swarthy Italians might have blue eyes and light-colored retina and show reverse morbidity rates.

A future study of these reports will no doubt give generalizations of considerable therapeutic value and enable us to bring health or at least comfort to a large number of blonds who now pass their uncomfortable lives in an excessive sun glare for which they have insufficient pigment-armor, and who so frequently become neurasthenic from that fact alone. I have recently been made aware of such unhappy mortals, who are fairly comfortable in the morning after a night of dark rest, but whose nerves begin to tingle with the increasing light and who by sundown are in more or less agony. Some of them have noticed the happy comfort of a rainy day or one of dove-colored cloudiness, and yet, in obedience to the doctor's advice to "get into God's sunshine as much as possible," have continued the very irritant which has been their undoing. The old "dark room" for certain eye cases has happily been abandoned, for the lack of fresh air is enough to prevent recovery from about everything and may actually cause tuberculosis, but it is possible to guard against the light and still get our patients outdoors where they belong in about every disease from tuberculosis and pneumonia to typhoid and puerperal fevers. There is a chance for a complete reversal in some of our ophthalmic methods if the profession will only realize that light is just as lethal to the protoplasm of a retinal cell as to that of a bacillus.

All new discoveries have a hard time in their efforts to be acknowledged and accepted by the medical profession. They all must go through a stage of virulent attack by men who can not change opinions held for a long lifetime. No physician over 40, when Jenner proved the success of vaccination, ever accepted it as a fact. Men are the same to-day, and there is a large class which will never accept the proof that light can ever harm anything except a disease germ. But there is sufficient evidence already available to permit discussion, and it is hoped that the matter will now be taken up and an earnest effort made to end the harm done by undue exposure of blond patients to excessive light. The phthisio-therapists and neurologists are beginning to think over it and the ophthalmologists should follow suit. If cases are such that the light is really too great for them, and no other protection is possible, perhaps a more or less prolonged stay in a dark, cloudy climate might be the means of effecting a cure, particularly in cases complicated by a neurotic taint or suffering from evident neurasthenia.

It is now proposed by those whose opinion is worth considering that white men in the tropics should wear opaque clothing, large opaque helmets and amber-colored glasses. To a very minor degree

the same advice holds good for blonds in our summers, particularly in the south.

This is pre-eminently a field for American ophthalmologists, by the way, for we have types from every part of the world and can compare their relative pigmentations and morbidities. Each European physician deals with a more homogeneous population, the vast majority of which is adjusted in complexion to its locality. They do not have the wealth of scientific material at our very doors. For these reasons, they have always been skeptical as to the existence of neurasthenia in any great degree—a disease found broadcast in America as a result of a lack of physical adjustment to our climates. As in neurasthenia, so in eye diseases due to insufficient pigmentation, American ophthalmologists must take the initiative.

REMARKS ON VIBRATORY MASSAGE IN EYE DISEASES.

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Finger massage of the eye is as old as medicine. It has been used direct, to the conjunctiva, or indirect through the lids, the movements being vertical, horizontal, circular or radial. While employed without or with medicaments, usually some ointment—most frequently a mercurial—is placed in the conjunctival sac or on the lid. It is not easy to separate the benefit of the mechanical movements from that of the medicine used—probably the movements with or without pressure are most important. Every ophthalmologist uses this treatment, in some form, with varying degrees of frequency and satisfaction in chronic corneal or conjunctival disease.

In the treatment of obstructions in the retinal vessels, Dr. Würdemann urges deep pressure, with movements on the eyeball, so hoping to dislodge the obstacle and restore vision.

Midway between these forms of massage are such pressure movements as affect the ciliary circulation and hasten the escape of lymph from the eyeball, so reducing pressure. It is said to render the operation for glaucoma easier by deepening the anterior chamber, while reducing the tension, and to affect favorably many forms of chronic chorioidal and uveal diseases.

Sometimes good service is done by gently striking the eyeball with the ends of the fingers, more or less rapidly, so getting the effect of interrupted blows.

Massage of the lid margins for blepharitis marginalis and associated affections, with varying strengths of mercurial ointments, is a familiar practice, having the double effect of killing microbes and reducing the swollen tissues.

This introduces the question, "What, if any, addition has vibratory massage brought to ophthalmology?"

To the friction of finger massage, as it passes to and fro, up and down, round and round, with more or less pressure on the eyeball, vibratory massage adds a longer or shorter, slow or quick vibration, starting from the point of the instrument as it touches the eyeball,

and passing to every other part, along nerve or blood vessels up to the brain and other adjacent structures. It must thus quicken the outgoing currents of lymph and venous blood, so inviting to the vacant spaces good arterial blood and fresh lymph. It must stimulate the sensitive nerves and provoke vasomotor activity with an accelerated arterial current. It must arouse to increased action every visual or nutritive cell and tend to break up irregular activities in any part of the ocular apparatus.

Like other ideas, much relative to vibratory massage has come from without the recognized profession. As is usual from such sources, the wildest claims have been made for its power, and so it has been discredited in advance of actual investigation by persons of good judgment. In the books and journals within my reach I have found little relating to vibratory eye massage, and this very indefinite.

Compared with "finger eye massage," the vibratory calls for a delicate special apparatus, of considerable expense to install or maintain, and apt to need repairs at inopportune times. Its best operation calls for connection with a street current, thus limiting its use to those having such a current or willing to bother with galvanic batteries. The use of vibratory massage is a large time consumer, mainly in getting the patient in relation with the apparatus, so that the busy doctor must believe that he can accomplish by it something beyond old methods, else he will pass it by.

Vibratory massage has psychic as well as material effects which must be carefully distinguished in estimating their relative value, though each may often aid the other.

Some years since I had a manufacturing electrical company combine in one instrument the means of transforming the street current into each of the forms known to be useful in managing diseases of the eye and related organs. Since then as opportunity presented I have tried to ascertain what, if any, value vibratory massage has over older methods. This apparatus, driven by a one-eighth horse-power motor, has a convenient and effective device for giving vibratory eye massage. It admits a wide range of length, frequency and force of vibration. It gives deep or superficial massage, in any direction, as well as the tips of the fingers, adding to the latter a vibratory movement slow or rapid, long or short, light or heavy, as may be desired.

While the exact effects of this addition to eye massage has never been satisfactorily worked out, certain facts seem reasonably certain. Thus (1) if one places his finger on the eyeball while applying massage, the vibrations are distinctly felt, showing that they reach

the entire eyeball and hence the nerves, blood vessels, muscles and lymphatics attached thereto. (2) Most patients recognize a greater clearness of vision and are usually able to read more and easier, as proven by using test types, before and after the massage. (3) The fundus is more distinctly seen by the ophthalmoscope after massage. (4) Varying with the pathological conditions, definite changes can be observed in the central retinal vessels, generally an enlargement of both central retinal veins and arteries. (5) Often the fundus reflex exhibits a brighter tint, showing an increase of the arterial element in the chorioidal circulation. (6) Occasionally the retinal veins are observed to pulsate. (7) Reduction of ocular tension is common, even after a brief application of vibratory massage. Thus following vibration of the eyeball we observe reduced tension, improved vision, greater clearness of the media, enlarged retinal vessels; effects only explained by assuming that there has been an augmented flow of lymph and venous blood from the eye and an inflow of arterial blood with new formation of lymph and aqueous humor. (8) Applied directly to the eyeball, vibratory massage leaves a conjunctival hyperemia, lasting longer or shorter in proportion to the length of application. (9) Through the eyelids, vibratory massage usually reduces the hyperemia of the conjunctiva and so removes congestion in chronic episcleritis and allied conditions.

Every observation points to an equalization by the vibration of existing functional irregularities, in motor, sensitive, special and vasomotor nerve fibers, with their terminal apparatuses and central ganglia, resulting in the normal rhythmical action of each with all for their common object.

Applied, in appropriate cases, in a proper manner, patients uniformly speak of a feeling of comfort after they get accustomed to the strange sensations.

Usually I have resorted to vibratory massage only after other measures have failed, or in connection with such measures when unsatisfactory. Thus, some weeks since, in treating a young lady for a chronic thickening of the conjunctiva and subjacent tissue of both eyes covering the lateral recti muscles and reaching the sclerocorneal junction, two vascular ribbons failed to clear with ordinary measures, but a few treatments by vibratory massage relieved the deformity.

In cases of *early incipient cataract* with radiating striæ and surrounding opalescence, vibratory massage usually increases vision so that one or more additional letters of Snellen can be seen immediately after the treatment. Sometimes this is permanent, but

usually transitory, as the conditions underlying the lens degeneration still remain. The explanation of this appears when we recall that the lens is nourished by lymph secreted by the ciliary and anterior chorioidal vessels, and enters the equator of the lens and after bathing its fibers escapes through the anterior capsule and with the aqueous escapes through the pectinate ligament and Schlemm's canal to the anterior ciliary veins; quickening this current, vibratory massage clears the media.

Illustrative of the value of vibratory massage in incipient cataract is the following: Mrs. S. M. applied for relief from failing vision and pain in eyes and forehead Feb. 27, 1907. She was a widow, aged 58, large and flabby, with muddy complexion. For many years she had supported her family by sewing, but for the last two had been unable to use her eyes much. Vision of right eye was twenty-seventieths and Jaeger No. 13; left eye twenty-fiftieths and Jaeger No. 13. Though she had half a dioptric of manifest hyperopic astigmatism, no glass improved her distant vision. Ophthalmoscopic examination showed striæ in both lenses, a hazy vitreous and small retinal vessels. Vibratory massage reduced the tension of both eyeballs; diminished the haziness of the vitreous; increased the size of the retinal vessels, and increased the vision in each eye to twenty-fortieths. In addition to the use of vibratory massage, attention was directed to rendering the secretions and excretions more normal, and hot water was locally applied to each eye, three times daily, for ten minutes. On Aug. 31, 1907, vision of each eye was twenty-thirtieths plus three letters, and with plus D. 3.00 S., Jaeger No. 1; four striæ had disappeared from the left lens and six from the right, leaving one stria in each lens mostly hidden behind the iris. Aside from these two striæ, the media of both eyes were quite clear. The pain in and about the eyes disappeared after the third treatment. Vibratory massage was used over and on both eyes, the nape of the neck and spine, three times weekly for the first month and less frequently later.

In cases of scleritis and episcleritis, vibratory massage has proved helpful, as in recent corneal opacities.

In case of recent chorioiditis, vibratory massage seemed to promote the clearing of the vitreous and hasten the absorption of the inflammatory deposits. The patient was a man, aged 56, healthy aside from a suspected syphilitic taint. For two weeks anterior to Nov. 12, 1906, he noticed a progressive failing in vision of right eye. On that date vision of the right eye was 20/100; considerable patch of Descemetitis in upper part of cornea, and a large patch of chorioiditis above the external to the macula. He was given full

doses of potass. iodid internally; hot water directed locally three times daily for ten minutes, and vibratory massage once per week. On November 19 vision was 20/70; November 29 vision was 20/50; December 20 vision was 20/40; January 14 vision was 20/30; January 24 vision was 20/30 plus four letters.

After each treatment by vibratory massage, more letters could be read; sometimes one, other times two or more. This was generally retained till next treatment, when there was a farther increase. The Descemetitis vanished early, and the chorioiditis retracted its dcers, though there remains a blind spot of considerable size.

In one case of optic nerve atrophy, vibratory massage was followed by an increase of vision in the right eye from twenty-seventieths to twenty-fiftieths plus one letter; in the left eye, from two-two-hundredths to four two hundredths. This improvement was present two and one-half months after treatment. Briefly, the case was a lady, 50 years old, who, twelve years previously, had suffered from nephritis, developing at the fourth month of pregnancy, and followed by miscarriage at the seventh month. Blindness in both eyes was complete for a long time, and she never became able to see more than the largest print with a magnifying glass. The visual fields were very restricted; pupils reacted but slightly to light; optic discs very pale (the left most); central vessels quite attenuated. The application of vibratory massage increased the size of the vessels perceptibly; slightly enlarged the visual fields; increased the visual acuteness as above stated.

In retrobulbar neuritis, from alcohol, tobacco, or both, vibratory massage has seemed to hasten recovery. The effect on the retinal vessels and general fundus could be seen readily with the ophthalmoscope and always showed an increased vascularity. The gain in vision depended on the stage of the disease. Sometimes a single treatment would increase vision by one, two or three letters; other times not at all. Sometimes the improvement would be permanent, other times not, according to the pathological conditions.

Among the functional disorders benefited by vibratory massage are cases of eyestrain, not fully relieved by the most perfect correction of both refractive defects and muscle unbalance. Many of these derive much comfort from vibratory massage to both eyeballs and nape of the neck. I recall the case of a steamboat engineer, many years a sufferer from awful headaches, in spite of the most perfect correction of a slight hyperopic astigmatism and a little esophoria. Vibratory massage applied as suggested relieved him, and an occasional treatment kept him quite comfortable.

Time forbids the presentation of detailed cases illustrating the

field in which I have found vibratory massage useful, but I ask indulgence to a brief abstract of two cases as quite unique. My diagnosis was "anemia of optic nerve and retina." The effects of vibratory massage were prompt, striking and permanent.

CASE 1.—On Jan. 21, 1904, Mr. W. F. E., aged 50, applied for relief from a persistent and rapid loss of vision, observed to begin about four months previous. Long a sufferer from piles, he had been successfully operated nine months before. He was a book-keeper, with the best of habits, except he smoked from six to eight cigars daily. Because of chronic indigestion, he had been under the care of a stomach specialist. He said that he had been treated by several excellent general practitioners and ophthalmologists, besides his surgeons and stomach doctors. Early in October, 1903, he could see perfectly well to read or work as he desired. But soon after, he noticed failing vision, until at date of his visit to me vision was 18/200 right eye, 6/200 left eye, increased by glasses to 20/200 and 18/200. The glasses worn were cylinders minus one and one-half diopters against the rule, with minus one diopter sphere. No increase of vision could be had with any other combination.

Visual fields were limited, though color fields were normal over the visual area. Tension was normal, as were the movements of the iris and reflexes. The media was clear, but the fundus was characterized by a deficient blood supply, matching the thread-like veins and arteries; the discs were uniformly pale.

As no organic disease could be made out and the retina was clearly suffering from improper nourishment, vibratory massage seemed indicated, especially as I had already seen that it increased the retinal circulation. This was accordingly applied, for three minutes, to each eye, over the closed lids, reaching every part of the eyeball possible by extreme rotation in different directions. He said that he saw much clearer and his vision rose to 20/200 Snellen each eye immediately after the treatment. The ophthalmoscope showed an increased size of the retinal vessels throughout, and the entire area looked brighter.

In the hope of maintaining this, he was directed to locally apply hot water for ten minutes every four hours to each eye. He was also directed to take a glass of koumyss four times daily; outdoor exercise was prescribed and such other mode of life as would improve his general condition.

Daily thereafter vibratory massage was given, in varying strength, during longer or shorter periods, till vision became normal, when it was dropped to alternate days, until May 16 he was discharged

with vision twenty-twentieths, Jaeger No. 1, able to read for hours without weariness. At the fourth treatment I noted that his vision was 20/70 right eye and 20/100 left eye. As seen by the ophthalmoscope daily, the vascularity of the fundus generally improved till it became normal at time of discharge.

A peculiarity of his improvement was the great difficulty in making an advance of a single letter one day and perfect ease in seeing the same letter on the following day or two.

He was restricted to three cigars daily, all smoked out of doors. At no time could retrobulbar neuritis be made out in accord with the judgment of the excellent eye men who saw him before his visit to me.

So far as a positive diagnosis could be made, the retina was starved by malnutrition, following a combination of rectal disease, chronic indigestion, mental worry and close use of his eyes. It seemed probable that irreparable organic disease was near, from starvation of the retina, had it not been averted by the means indicated. Now, nearly four years later, Mr. E. reports perfect vision, both near and far, with glasses, and ability to continue with ease close application to his books. There has been no failure in vision during these years, so that the restoration of vision was permanent.

CASE 2.—Mrs. O. F. L., aged 35, on April 3, 1907, sought relief from almost complete loss of vision in her right eye, first observed three days previous. She was unable to distinguish a flame in any portion of the visual field; with difficulty she counted her fingers at one foot, and no lens improved vision. Ophthalmoscopic examination showed the media clear, the central retinal veins large and arteries mere threads. Vibratory massage was applied to the ball for three months, when vision became 1/200. This was repeated daily, and to it added the local use of hot water and the internal administration of increasing doses of iodid of potass. On April 6 vision was 3/200; April 8, 10/200; April 13, 20/70; April 15, 20/50; May 2, 20/30. On May 13 she was able to distinguish flame in any direction. As vision improved, the retinal arteries increased in size till they became normal. When last seen, on June 15, 1907, the retinal arteries were alike in each eye and vision 20/30, Jaeger No. 1. This was increased by correcting the hyperopic astigmatism with hyperopia to 20/20 in each eye, thus O. D. plus DI. C. ax 90 deg. plus DO. 25 S. — O. S. plus DO. 50 C. ax. 70° DO. 75 S.

When first seen, vision of left eye was 20/40, Jaeger No. 1. At last visit it was 20/30, increased to 20/20 by proper glass.

Time does not admit of reference to other classes of cases in which more or less satisfactory results were attained.

Vibratory massage was introduced to the profession by Maklakow in 1893. He employed Edison's electric pen, the point being covered by an ivory ball, vibrating about 9,000 per minute. He found intraocular tension reduced even in glaucomatous eyes; helpful results were secured in parenchymatous keratitis and episcleritis.

Since others have reported good results in maculæ, follicular and granular conjunctivitis, iridocyclitis, traumatic cataract and hypopyon keratitis, Sneguirew, by experiment, showed that diffusion of fluorescein from the conjunctival sac towards the anterior chamber was markedly increased by vibratory massage while the tension was diminished. He explained this by saying that the vibratory massage quickened the lymph circulation in the cornea and conjunctiva.

MORAX-AXENFELD CONJUNCTIVITIS.

AN ANALYSIS OF THREE HUNDRED CASES.

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Perhaps the commonest and most widely spread disease of the conjunctiva is what is known as "diplo-bacillary," or Morax-Axenfeld, conjunctivitis. Described first in 1896 by Morax in Paris and Axenfeld in Marburg, it has since been reported from almost every clime. From the various parts of Europe, from Asia, Africa, and America, its presence has been made known. How common it is in Montreal may be judged from the fact that in the last two years, of 600 cases of conjunctivitis examined at the Montreal General Hospital, 300 have been of this type.

Morax-Axenfeld conjunctivitis was first described as a chronic catarrhal form which, from the associated blepharitis, was sometimes called blepharo-conjunctivitis, or from the reddening at the outer and inner canthi, angular conjunctivitis, so that a characteristic clinical picture was attributed to this infection as follows: Both eyes involved, beginning as a slight catarrhal conjunctivitis it increases in severity and in 24 to 48 hours there will be seen marked reddening of the lids, especially at the outer and inner canthi; some maceration of the skin and in the conjunctival sac a varied amount of watery discharge which gives the reddened lids a moist appearance. The blepharitis and the reddening at the outer and inner canthi make the picture a marked one. This is the appearance of the classical type first described, but Morax-Axenfeld conjunctivitis may be seen in any of the following forms:

1. A mild catarrhal conjunctivitis, where the patient complains of pain in the eyes, especially when reading at night.
2. A form of catarrhal conjunctivitis with some slight reddening at the outer and inner canthi (angular conjunctivitis).
3. A catarrhal conjunctivitis with accompanying blepharitis (blepharo-conjunctivitis).
4. Acute purulent conjunctivitis.

In many cases Morax-Axenfeld shows the characteristic clinical picture of a mild catarrhal conjunctivitis, with reddening at the outer and inner canthi, and in these cases a temporary diagnosis may be made from the clinical signs. But it is to be remembered that many cases showing a like clinical picture will present themselves where the etiologic factor is not a bacteriologic one. No disease of the conjunctiva presents at times such a typical clinical picture as does this form, but at other times the clinical picture will give you no indication that the infection is a diplo-bacillary one.

In many cases of blepharitis your bacteriologic examination will give you entirely negative results. Indeed, I feel much more like advising a thorough refractive examination in all cases of blepharitis and eczema of the lids than I do a bacteriologic one, and I believe the results from the examination of the refraction will be more satisfactory. I have seen case after case of blepharitis and eczema of the lids where thorough bacteriologic examination gave negative results. Persistent cases, now slightly improved, now worse, when the errors of refraction were corrected then only were satisfactory results obtained.

The examination of 300 cases in Montreal has been an interesting experience. I am inclined to believe the subjective symptoms in this form of conjunctivitis are more severe than we have thought. The majority of these cases were of the outdoor class, people who are not used to complaining of slight pain, but the vast majority stated that the pain in the eyes was severe and more marked at night when they tried to read. Others complained only of epiphora. In some cases the epiphora was very marked and resembled the condition seen in patients with a foreign body on the upper palpebral conjunctiva. I have been struck with the number of acute cases that have been seen here, cases which clinically were Koch-Weeks or pneumococcus conjunctivitis, where examination of the discharge showed them to be diplobacillary. Last year I reported three cases of acute purulent conjunctivitis seen within a short time of each other where the clinical signs pointed to gonococcus infection. One case was caused by the gonococcus, one by the Koch-Weeks bacillus, and one by the diplobacillus. The latter was a nurse, aged 20, who, with the children of a family, went to the country on a Friday. Monday morning, on awakening, her eyes were painful and inflamed. Later in the day she was referred to me in private to see if her presence was dangerous to the children's eyes. When seen Monday afternoon, both eyes were involved. There

was marked swelling of the lids with edema of the conjunctiva and profuse purulent discharge. She complained, too, of severe pain in the eyes. She was treated with the sulphate of zinc, gr. $\frac{1}{4}$ to the ounce, made rapid progress, and one week later was allowed to resume her duties as children's nurse.

Quite a number of cases were seen, too, where follicles were prominent, especially in the lower palpebral conjunctiva. These cases resembled somewhat trachoma. Treatment, however, with the proper remedies for 24 to 48 hours gave an entirely different picture, and showed catarrhal conjunctivitis without the supposed trachoma. Diplobacillary conjunctivitis was seen quite often, associated with old cases of trachoma; the diplobacillus, in fact, seems rather prone to inhabit these old trachomatous conjunctivæ. In cases of ectropion and distichiasis, too, diplobacilli were found in the conjunctival secretion. Among these 300 cases there were 6 cases of phlyctenular conjunctivitis where diplobacilli were found in the conjunctival sac, and where the phlyctenular condition cleared up quickly when the accompanying diplobacillary conjunctivitis received proper treatment.

This series gave us some interesting statistics regarding the age and nationality of the patients and the season of the year when this form occurred most frequently. Of this number, 54 per cent. were Jews, 38 per cent. Canadians and 8 per cent. were Greeks and Italians. These figures show the statement that "it is generally found among the foreign element" to be a misleading one. Considering the proportion of Canadians to foreigners who attend our clinic, 38 per cent. among Canadians is high. Morax-Axenfeld conjunctivitis is seen generally in adults; we have had, though, quite a number of cases in infants, one being six weeks, another eight months, with well marked signs of the disease. Nine per cent. of the cases were before 10 years of age, from 10 to 20 years 25 per cent., and over 20 years 66 per cent. Diplobacillary conjunctivitis is supposed to occur most frequently during the hot and dusty seasons of the year (Gonin, Erdmann), but this has not been our experience, cases here being very frequent during the cold and wintry months. The largest number occurred in January, when 17 per cent. of the cases presented themselves at the clinic, and during November, December, January, February, March and April 48 per cent. of our cases occurred. No epidemic of conjunctivitis due to the Morax-Axenfeld diplobacillus has as yet been reported, but I have noted time and again one or two members of

a family to present themselves at the clinic, to be followed shortly after by one or more members of the same family.

With clinical types so varied, and with such numerous associations as has diplobacillary conjunctivitis, it will be readily understood a diagnosis can only be made by bacteriologic methods. The cause of this form of conjunctivitis is a diplobacillus which has very characteristic morphological and cultural features. From a case of Morax-Axenfeld conjunctivitis one takes with a platinum loop a little secretion from the conjunctival sac and smears it well over a glass slide. It is then fixed and stained, preferably by Gram's stain, using as a counter stain a weak solution of safranin. If now examined with the oil immersion lens, the etiologic factor of this form of conjunctivitis will be found. Over the field a multitude of Gram negative bacilli, lying chiefly in pairs, will be seen. They are 2 to 3 μ long by $1\frac{1}{2}$ μ wide. They vary in size, look square at the ends, but closer examination will show them to be somewhat rounded. They lie either free or within the pus cells. Where there is much purulent discharge they will be found frequently within the pus cells. Whether the Morax-Axenfeld diplobacillus has a capsule or not has been a much disputed question, but I think the majority of persons acquainted with this micro-organism now believe it to be encapsuled.

The Morax-Axenfeld bacillus is one easily recognized. The only bacilli likely to be mistaken for them in the smear are the bacillus *Ozæna*, bacillus Friedlander and Petit's diplobacillus. These are all very rare inhabitants of the conjunctival sac, however, and are readily differentiated in media. From bacilli of the diphtheria group, from zur Nedden's bacillus, the Koch-Weeks bacillus, and other pathogenic conjunctival micro-organisms, it is easily distinguished. For practical purposes the cultural characteristics of the Morax-Axenfeld diplobacillus are not so necessary. In the vast majority of cases your diagnosis can be made from your smear preparation. When it is to be differentiated from Petit's diplobacillus, cultivation is necessary. The Morax-Axenfeld diplobacillus grows only on blood serum, ascitic or hydrocele agar, or hemoglobin agar, serum agar and serum bouillon. It has been cultivated, too, on glycerin agar, but the most satisfactory media is said to be blood serum. After 24 hours one sees over the surface of the serum tiny moist looking depressions. These gradually spread, increasing in depth and width, gradually liquefying the blood serum. This appearance on blood serum is characteristic. Lique-

fraction continues for about two weeks; even on the second day one finds the prepared slide filled with involution forms.

On serum agar media the colonies show themselves as flat, grayish bodies, which resemble somewhat the appearance of the bacillus xerosis. On serum bouillon the growth produces a turbidity. Upon ordinary agar the Morax-Axenfeld diplobacillus does not grow as a rule, although both Axenfeld and Erdmann have cultivated this organism upon this media. Loeffler's neutral and slightly alkaline blood serum has been recommended as the most serviceable media for the Morax-Axenfeld diplobacillus, but in many ways it is unsatisfactory. The initial tube is nearly always a mixed growth of staphylococci, xerosis or some of the other conjunctival bacteria, with the diplobacillus. I have seen in print: "With the ordinary staphylococci of the conjunctival sac growth does not seem to be impeded," and, further, "one may frequently find the diplobacillus in the conjunctiva in pure culture." In my limited experience I have rarely found the Morax-Axenfeld diplobacillus in pure culture on blood serum in the initial growth; I have generally found it with some of the pyogenic cocci, commonly the *Staphylococcus epidermidis albus*. The growth of the cocci by changing the reaction always interfered with the growth of the diplobacillus, and it was only after a great deal of transplanting that I obtained it in pure culture.

Because I found this way so inconvenient I tried growing the diplobacillus on alkaline human hemoglobin agar. Upon these tubes one finds over the surface separate colonies of the different pyogenic cocci, generally the *Staphylococcus epidermidis albus*, which on this media has a bluish, glistening appearance. Between these one finds small raised grayish-colored colonies which resemble very closely the colonies of the bacillus xerosis. With the greatest ease the diplobacillus may now be obtained in pure cultures by picking off one of these colonies and transferring it to other hemoglobin agar or blood serum media. This is by far the simplest way of obtaining the Morax-Axenfeld diplobacillus in pure culture, and is a method which I have not seen reported.

The cultural characteristics of the Morax-Axenfeld diplobacillus differentiate it easily from the other known pathogenic conjunctival bacteria. There is, however, another diplobacillus which must be considered, the diplobacillus liquefaciens of Petit. In morphology it is strikingly similar to the Morax-Axenfeld, but on media it is very different. It grows readily and profusely on the ordinary culture media and liquefies gelatin—two characteristics which the

Morax-Axenfeld does not as a rule possess. I have grown the Morax-Axenfeld diplobacillus on agar-agar, but the appearance of the growth is very different from that of Petit's diplobacillus. On hemoglobin agar the Morax-Axenfeld diplobacillus is a fine raised colorless or grayish growth, while the Petit shows itself as a profuse raised grayish growth.

The diplobacillus of Morax-Axenfeld is not pathogenic for the ordinary laboratory animals. I have inoculated the conjunctival sacs of rabbits, guinea-pigs and mice with negative results; later I abraded the corneal epithelium in the guinea-pig and inoculated the sac and cornea with negative results. For man, however, it is pathogenic. Morax set up a typical conjunctivitis in a colleague's eye. Some time ago I inoculated a conjunctiva which I had proved to be free from bacteria with a loop full of a 24-hour growth of the diplobacillus. I lost sight of the patient for some days, but when I saw him one week later he had a well-marked typical diplobacillary conjunctivitis. Smears were made which showed the diplobacillus, which was obtained later in pure culture. Erdmann has shown that the diplobacillus stands drying well. From pieces of dried gauze which 14 days previously had been soaked in a bouillon culture and later subjected to dry heat, he was able to obtain cultures.

The pathologic changes in the conjunctiva in diplobacillary conjunctivitis have been described by Stock, Morax and Petit and Paul. The following description is from Stock's article:

"The squamous epithelium of the lids extends as far as the inner lid margin. At the outer margin and at the edge of the lid numerous epithelial saccules may be noticed dipping into the deeper structures. About the lid margin the squamous epithelium is thin, the outer horny layer for the most part removed. At this point there had been noticed clinically a loss of tissue. The columnar epithelium of the palpebral conjunctiva of the lower lid in the lid margin area does not consist, as in the normal, of two, but of four, five or six layers. Between the isolated epithelial cells are leucocytes in varying numbers and at certain points they are so numerous that they hide the epithelial cells. On the mucous membrane adjacent to the inner edge of the lid one sees in the adenoid layer a large number of epithelial saccules, the so-called glands of Henle. Between the epithelial cells and in the depth of the epithelial layer lie only a few goblet cells. The more we leave the lid margin and approach the area of the transition fold the more frequently do we meet with these cells, so that at the transition fold the conjunctiva at certain points is almost completely

covered with them. At the upper lid the conjunctival epithelium consists of two layers. Here, too, in the lid margin area we find a great number of these epithelial depressions, while goblet cells are found in an enormous number near the upper fornix. In the mucosa of the palpebral conjunctiva the cells are completely hidden by a diffuse round-cell infiltration. At certain points lie dense masses of round cells. This infiltration extends into the uppermost part of the submucosa, the deeper parts are not involved. Beneath the epithelium of the bulbar conjunctiva this infiltration is hardly noticeable. In some places the Meibomian glands have gone on to cyst formation and the epithelium in the cysts destroyed and replaced by connective tissue. In the posterior parts of the Meibomian glands of the upper and lower lid at certain points were noticed calcareous degeneration; there was no reactive inflammation about these foreign bodies. In the conjunctival sac also, between the cilia of the lids, was found débris with pus cells (mucous secretion). Diplobacilli were not found."

Morax and Petit examined one case and demonstrated the presence of the diplobacilli.

The diplobacillus of Morax-Axenfeld has been found in the lacrima sac (Axenfeld) and in odd cases in the normal conjunctiva. This fact is of interest where operations on the globe are being considered. I operated last fall on a case which I saw for the first time in the operating room. The operation was enucleation for a ruptured eyeball. The day following on dressing the case I found a discharge coming from between the lids. The latter and the surrounding parts were enormously swollen. Only then did I find out that the patient was the subject of a Morax-Axenfeld conjunctivitis. How closely the diplobacillary infection and the enormous postoperative swelling were associated I am not prepared to say.

On the other hand, Axenfeld saw a severe perforating wound in a case of diplobacillary conjunctivitis heal quietly.

The diplobacillus of Morax-Axenfeld is frequently found in the noses of patients suffering from this form of conjunctivitis. I have examined many cases and demonstrated the presence of diplobacilli in the nose. When we consider how chronic this form of conjunctivitis is and how full of diplobacilli we find the tears in the conjunctival sac, does it seem extraordinary that they should be carried into the nose?

The complication most liable to occur is a serious one—ulceration of the cornea. It is now known that the Morax-Axenfeld diplo-

bacillus can give rise to ulceration of the cornea as severe in type as the *ulcus serpens* of pneumococcus infection. It is, luckily, however, not a common complication. Among the 300 cases in 11 only was ulceration of the cornea seen.

Weigeln has lately reported a purulent keratitis complicating a case of Morax-Axenfeld conjunctivitis in an infant of two months.

The treatment, par excellence, in Morax-Axenfeld conjunctivitis is frequent irrigations of the conjunctival sac with a weak solution of the sulphate of zinc. Thorough irrigation with the instillation of drops of gr. $\frac{1}{2}$ to the ounce, three or four times daily, will give you exceedingly satisfactory results. I have treated cases with argyrol and silver nitrate to no purpose. In no case of Morax-Axenfeld conjunctivitis where the patient has followed the directions have I seen the sulphate of zinc fail. I have seen cases return, especially children, with no improvement, but here the failure was due to the inability to instil the drops. For this reason I always make it a point with these cases which return unimproved to thoroughly irrigate the sac myself.

Where diplobacillary conjunctivitis is found associated with trachoma I would advise treatment of the trachoma with silver nitrate, or whatever measure is thought best. Such cases treated only with nitrate of silver will not make satisfactory progress until zinc sulphate solution has been added to the treatment.

In a letter to me recently, Blaauw advised the trial of the salicylate of zinc in diplobacillary infections. Kelly showed argyrol and protargol to be quite inefficacious in Morax-Axenfeld conjunctivitis. Treatment was continued for a month with no appreciable improvement.

In using the various solutions of the sulphate of zinc dropped into the eyes night and morning, Kelly found that in using the gr. i to the ounce solution the diplobacilli were present six weeks later; with a solution of grs. iv to the ounce after three weeks diplobacilli could not be found, while with the solution of grs. viii to the ounce the average duration of the presence of the organism was 13.5 days.

Silva, in Axenfeld's clinic, could not prove a diffusion of the sulphate of zinc through the cornea, and showed, as we have found clinically, that zinc checks the bacilli but does not kill them.

We have, then, in Morax-Axenfeld conjunctivitis an exceedingly common affection of the conjunctiva, a form which varies so in its clinical picture from mild catarrhal to acute purulent conjunctivitis

that a diagnosis must be made from bacteriologic methods. It is a form of conjunctivitis that is exceedingly chronic, but will be found to react surely and well to its specific, the sulphate of zinc.

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THE EVIL EYE AMONG THE HEBREWS.*

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Medical superstition as a result of inadequate knowledge of natural phenomena was a dominating factor in the past, and to a considerable extent holds sway even to-day. This superstition is as old as the human family, and, of course, the Hebrews are not entirely free from it. It finds its origin in the fact that primitive mankind considered all terrestrial phenomena the direct manifestation and steady interference of supernatural powers. It was during this period of evolution that disease was ascribed to the direct interference of the Deity in the affairs of man. Of course this superstition is of theologic origin, and traces of its existence even at the present time are still prominent in the eyes of the observer. The ancient Hebrews, as well as many other nations, also considered disease to be the direct punishment from God for the shortcomings of men. The Talmud teaches that "no man cuts his finger here below unless it had been first determined upon from on High."¹ In fact, the Talmudic dictum is: "All comes from above except heat and cold;"² that is, all diseases, excepting those due to heat and cold which are, therefore, preventable, are directly sent unto mankind from God.

Medical superstition appears in several forms, depending upon the origin of the supernatural cause. Primarily it was of a religious origin, later it received a philosophic form and some have assumed a physical character. It is often impossible to trace the origin of certain superstitions; this is especially the case with the evil eye. This superstition is very widely spread and holds sway over multitudes in many countries. The ignorant Hebrews of Russia, Poland, Roumania and Hungary believe in the power of the evil eye. It was a prevalent belief among the ancients that some people possess the power to bewitch and do harm by spiteful looks, that their glance is highly poisonous, producing disease which eventually causes death. Not only was this belief common among the ignorant classes but also among the members of the higher spheres of social life. It is still a common belief of the ignorant masses of various peoples. We shall, however, confine our efforts

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in this paper to the evil eye among the Hebrews. An attempt to analyze the origin, the nature of this superstition, its growth and development leads us into a sea of uncertainty; all we can say is that it is prehistoric in conception.

In limiting our field of investigation to the Jewish people we must, of course, have recourse to the Biblical writings. It is of interest to note that no mention of it is made in the sacred literature. The Biblical term (*rah ayin*) means a jealous eye, i. e., an eye that envies, a miser's eye. We do, however, find evidences of this superstition in the Talmudic writings, and to give it an authoritative force the writers of the Talmud have tried to inject it into the Bible by means of interpretation. Thus, for instance, the sentence, "And the Lord will take away from thee all sickness,"³ is so interpreted as to mean the evil eye.⁴ The priestly blessing, "God bless thee and protect thee," is, according to Midrashic interpretation, a protection against the evil eye.⁵ Jacob's advice to his children not to enter Egypt by one gate is also taken as a warning against the influence of the evil eye.⁶ The Midrashic version is, "Ye are strong, ye are nice, enter not the gates of the city together, do not stand at one place so that the evil eye may not overpower you."⁷ The story of Sarah and Hagar, as given in Midrashic literature, is interpreted to convey the idea that Sarah has thrown an evil eye upon Hagar. Ishmael, the son of Hagar, at the age of 27, was so crippled that his mother had to carry him on her shoulder, the evil eye being responsible for his lameness.⁸

Another interesting statement in this connection is that Sarah, having thrown an evil eye upon Hagar, caused her to abort her first child.⁹ The evil eye has been considered an etiologic factor in the causation of abortion. The specific order given by Joshua to the spies to hide themselves in the forest was a means of protection against the evil eye.¹⁰ These are some of the interpretations or injections of the evil eye superstition into Biblical literature. Considering the original text, we need not hesitate in emphatically stating that the interpretations are entirely groundless and that the sacred literature is free from the stigma of this superstition.

In Talmudic times the belief in the evil eye must have been very prevalent; this can be seen from the frequent references to it in the Talmud. In Talmudic language it is known as "*En Bisha*" or "*En Rah*;" the latter has remained the popular term, meaning an evil eye. Much importance is also attached to it in Midrashic literature. The evil eye brings great misfortune to this world.¹¹

It had ruled over Israel and caused it to bow to the golden calf,¹² and as a result they suffered destruction and were compelled to go into exile to Babylonia.¹³ The pupils of Akiba were all destroyed by the evil eye.¹⁴ That some of the Talmudists have shared in this belief and its power for evil can be gathered from the following extreme doctrine, that only "1 per cent. of all the dead died from natural causes, while the other 99 per cent. die of the evil eye." This extravagant claim is backed up by a special investigation of Rab, who in a certain burial ground held communication with the dead, and after this peculiar method of experimentation announced the important result, "ninety-nine by the evil eye and one in a natural way."¹⁵ It is interesting here to mention that the same extravagant claim had been made by Maimonides, the great Jewish philosopher and physician, for the excessive indulgence of sexual intercourse: "One per cent. dies of other diseases and 99 from over-indulgence in the sexual passion."¹⁶ How far the Jews believed in the efficacy and power of the evil eye may also be surmised from the fact that they have incorporated in the morning prayer an invocation for the protection against the evil eye.

SUSCEPTIBILITY OF THE EVIL EYE.

Just as in other diseases, there are predisposing factors to the evil eye. The attractive and beautiful are, of course, most susceptible, for it gives rise to envy and jealousy. Children are very susceptible to its influence, and especially male children. In fact, it was considered a good omen when the first born child was a girl; she was supposed to have a natural immunity against the evil eye.¹⁷ This superstition has changed, and the people no longer think it a good omen if the first born baby is a female child.

The causes that produced this change are, of course, potent factors in our social life: (a) The desire to perpetuate the family name. (b) The religious desire to have some one to say the Kaddish prayer after the dead (only boys are entitled to this privilege in orthodox circles). (c) The comparative trouble in raising a boy and a girl. (d) The necessity for providing a dowry for a daughter.

Great men are susceptible to its influences. According to Rabbi, after they were rescued from the fiery furnace, Elieser, Hannaniah, Mishael and Asariah were killed by the many eyes that were directed at them in astonishment.¹⁸ When the people demanded that Judah should come up to the pulpit from his school bench his father, the patriarch Simon Ben Gamliel, said, "I have only one dove among you: do you wish to take him from me by destroying

him?" meaning that if Judah is placed in the leader's position the evil eye from the audience will do him harm.¹⁹ The evil eye is apt to be operative in public places; it is said that the evil eye had its power even over the two tablets of the covenant because they were given in public.²⁰ "Street venders or those who display their goods in public never see the blessing of success." Rashi explains this to be on account of the evil eye.²¹ Judging by the amount of display of goods in public by the Jewish venders this superstition has evidently disappeared. Women are also very susceptible to the evil eye; an indication of this fact is to be found in the peculiar circumstance that the word "woman" (*Nushim*) in numerical value equals the word "*En rah*."²²

Some great men have the power of the evil eye. When Rabbi Elieser Ben Hyrcanus was shut out of the place of teaching, every spot upon which he turned his eyes was burned up; even a grain of wheat upon which his glance fell was half burned while the other half remained untouched, and the pillars of the gathering place of the scholars trembled.²³ Simon Ben Johai and Rabbi Jochanan could with their looks transform people into a heap of stones.²⁴ According to Kabbalistic literature, one should rather walk 100 miles out of the way to avoid meeting a man who possessed an evil eye.²⁵ An object found should not be placed before the public on account of the evil eye.²⁵

IMMUNITY.

Natural immunity, according to Talmudic literature; the sons of Joseph have absolute immunity against the evil eye. Says Rabbi Jochanan, "I am of the children of Joseph, over whom the evil eye has no power."²⁷ The evil eye may, according to some writers, be working unconsciously without any intention to do harm; in fact, according to one author, every one possesses the evil eye, and it would, indeed, be more frequent a cause for evil but for the resisting power of men counteracting the evil influence.²⁸ This opinion is not shared by all. According to Naphthali Katz, it is essential that one concentrates his mind to the desire of producing an evil eye in order to be effective. It is also necessary when looking or giving an evil eye that one eye be closed. As long as both eyes are open, man is in the image of God and, therefore, can not do evil; but when he closes one eye he then resembles the *Sitra Achra*, an evil-producing demon, or the *Keteb Merirah*, and is able to do evil by giving an evil look.²⁹ It would follow from this that the one-eyed man has a more potent influence in the evil eye superstition, and such was really the general belief, for while

the blind in both eyes were the object of pity, the blind in one eye were shunned by the people and considered the offspring of Billeam.

It is customary among the ignorant, and, for that matter, even among the semi-cultured and religious Jews, when speaking of some beautiful child or person, or on success, or anything that is apt to provoke the evil eye, to add the words "Unbeshrien," i. e., "not to be over cried," as a pacification so as not to be understood that the desire is to provoke the evil eye. Another term often employed is "Kein En Horah," i. e., "No evil eye." This is mostly used by the Russian Polish and Roumanian lower classes. They consider women in their puerperal state especially predisposed to this danger. The new born baby is apt to be influenced by the evil eye and should, therefore, not be shown to strangers. The bride is exposed to the danger of the evil eye and should, therefore, be veiled during the wedding ceremony. This practice is also common among the Chinese.³⁰

How common is the belief in the evil eye among the Jews may be learned from the fact that there are specialists devoted to the cure of this condition. They are known as "Unsprechers."

The evil eye has power not only over persons but also over animals and inanimate things. Bad luck or sudden business reverses are attributed to the evil eye. The following rule, enunciated in the Talmud, corroborates this statement: "Man should not stand in the field of his neighbor when it is in full bloom for fear of the evil eye."³¹

THE EVIL EYE THEORY.

It is not my intention to enter into a discussion on the theory of the evil eye as found in general literature; relating to various other nations, I can only refer the readers to Elworthy's book on the evil eye, where several theories are advanced. From the Jewish sources only two theories are to be considered. One is the old ghost theory, the other is a new scientific theory of evaporation. The ghost theory depends upon the belief that numerous evil spirits exist in the eye which at certain occasions, under provocation, may do harm to others, cause disease and even death. The ancient Jews were, of course, believers in ghosts and the bulk of the Jewish, as well as non-Jewish, public still believes in evil spirits.

It is not amiss to remark here that the leaders of many churches still preach the power of Satan and devils as part of their dogmatic religious convictions. These spirits hover everywhere and are also

to be found in the eye. Rabbi Hunnah says that one has a thousand to his left and a thousand to his right side.³² According to Rab, the feeling of oppression around the bride comes from them; they are invisible but may be seen. "Place finely sifted ashes around your bed and in the morning you will see their foot-prints."³³ It is highly probable that the practice among the Jews to cover the eyes of the dead with pieces of porcelain is to guard against the evil spirits hovering in them. It is very easy to transfer the evil spirits from place to place and finally lodge them in the eye through which the evil eye is produced. It must also be observed that the treatment for the evil eye and for demons is practically the same: incantations, amulets and magic formulas. Of course witchcraft has also been considered an evolution of the ghost theory, and witches and sorcerers were supposed to have control over some spirits. Thus prayers to ward off demonic influences, as well as the evil eye, found their way into Jewish liturgy.³⁴

The theory of evaporation is explained in the following way: The eye, like the skin, has pores through which some waste products evaporate. This vapor is highly poisonous in nature and may produce disease and even death. The writer of this theory goes even further and tries to use the principle of refraction to explain his superstitious belief by saying that the evil eye is more effective when these vapors have passed a convex or collecting glass, for after the refraction of these emanations they come to a focus at one point and are, therefore, more potent. Beware, then, of the man who wears convex glasses!³⁵ The conclusion is correct but the premises wrong.

According to this theory, we all have the power to "overlook;" thus a good man may occasionally possess an evil eye against his own will. This is, of course, not the case in the ghost theory, where concentration of mind and a desire to do harm is essential.

Diseases attributable to the evil eye are not of a special character, manifesting a well-defined symptomatology. Any disease at all, and especially those coming on suddenly, are considered by the populace to be caused by it. Puerperal conditions, even sepsis, diseases of the new-born are often spoken of as being "overlooked."

The treatment of the evil eye is rather interesting. In principle the Jews use the same protective measures as other peoples, namely, incantations, amulets and some special formulas; but the methods are different. When one gets suddenly ill the first thing to do is to think of the last person that visited the house, so as to trace the etiologic factor to him; then the diagnosis of having

been "overlooked" or an "evil eye" is suspected. The next step in the procedure is to demonstrate the correctness of the diagnosis. They take a glass of water and put into it seven burning coals; if these remain floating then the diagnosis is not correct, at least not with any degree of certainty; but if they sink to the bottom then the correctness of the diagnosis has been established beyond any shadow of a doubt. In this country this experimental process is not practiced. The reason for its decline is in the difference of the nature of coal used for fuel. The hard coals used in this country are not well adapted for this purpose, for they all sink in water.

The diagnosis having been experimentally established, the next thing to do is to take some object belonging to the sick, a cap or a handkerchief, and take it over to the "Unsprecher" specialist, who by some incantation will cure the evil eye by driving it away. There are several incantations in use, but I shall give here only one form, which I found in the book "Kaf Achath" entitled an "Empirical and Experimental Incantation for an Evil Eye." "I conjure ye, ye all spirits of foul eyes, black eyes, white eyes, blue eyes, green eyes, long eyes, short eyes, broad eyes, narrow eyes, straight eyes, distorted eyes, round eyes, sunken eyes, prominent eyes, seeing eyes, speaking eyes, split eyes, flowing eyes, man's eyes, woman's eyes, husband's eyes, wife's eyes, mother's eyes, daughter's eyes, eyes of a woman and her relations, young man's eyes, old man's eyes, virgin's eyes, old woman's eyes, widow's eyes, legally married woman's eyes, divorced woman's eyes, all evil eyes that exist in the world, that saw and spoke with an evil eye upon N. the son of N., I decree and conjure you by the holy celestial eye, a unique eye, a broad eye, an eye that is the most white, an eye that is completely white, an eye that is all right, an open eye, a providential eye, an eye that is all merciful, compassionate, embodying all compassion, an eye that is all, an eye that has no blemishes, an eye that is neither red nor beautiful, an eye before which all evil eyes are hidden and to which all are subordinated, an eye that guards Israel; as it is written, 'The guard of Israel neither sleepeth nor slumbereth;' and it is also written, 'The eye of the Lord is upon those that fear him and hope for his mercy.' By this celestial eye I decree and conjure ye, ye all evil eyes, that ye depart and flee and run and keep aloof from N., son of N., and from his household and you shall have no power to prevail over N., the son of N., and his house neither by day nor by night, neither when he is awake nor in dream, neither in any of his members of

his 248 members nor in any of his sinews of his 365 sinews, from to-day and hereafter."³⁶ This is, of course, no prayer, and while the incantation is offered in the name of God it is not an appeal to God to interfere in behalf of the sick; the underlying principle is in the power of the "Unsprecher" to drive away the evil. A formula as a prophylactic means is given in the Talmud: "Whoever is on the point to enter a city and is afraid of the evil eye should place his right thumb in his left hand and his left thumb in his right hand and say, 'I, N., son of N., am of the seed of Joseph, whom the evil eye may not touch'."³⁷ A horse can be protected against the evil eye by hanging between his eyes the tail of a fox.³⁸

These are some protective measures found in literature and which are not in use at present. To protect a child from the evil eye, "Take the kernel of an almond, make a hole in it, place three little white stones found in the gizzard of a black rooster and add to it a little mercury, close the opening with a little wax and let the child wear it."³⁹ For a protective amulet, "Take a silver or copper piece of metal and inscribe the Hebrew letter H, and let the child wear it."⁴⁰ An amulet is supposed to act either by attracting the evil eye to its important self and away from the victim or it acts as a repellant. The psychic value is not discussed in this paper.

To cure an evil eye take a glass of water, place into it seven burning coals and repeat the following sentence: "And the people cried unto Moses and he prayed to God and the fire was extinguished;" then give the patient to drink from the water.⁴¹ The following is the most popular antidote practiced in this country: Take a handful of salt and pass it around the head of the child that has been "overlooked;" throw a little of it in each corner of the room and the remainder over the threshold. Another popular remedy: the mother kisses the child that has been "overlooked" three times, spitting after each kiss. In Poland if a child has been "overlooked" by the evil eye the mother counteracts this spell by licking the head of the child three times, and spitting several times, repeating the following formula: "Ny hory, Ny hory, Ny buri, Ny kory," which in Polish means "Neither mountain nor forest, nor barley nor oats." Another practice among the Polish element to counteract the influence of the evil eye: spit three times on your finger tips and each time make a quick movement with your hands in the air. It is perhaps to this superstition that we may ascribe the origin of the hand motion so commonly employed by the

Jews during conversation, originally having waved their hands to ward off the supposable influence of the evil eye. In prasing a good looking person it is well to say, "May the Eternal guard him from evil." When the ghosts wish to do harm they first praise him by saying how beautiful he is.⁴²

There are a number of incantations, prayers and formulas to be found in various books; space, however, will not permit me to quote them all. Some of the remedies are very complicated and difficult to prepare. Urine, hair, nails and the feces of the new-born child have been employed in them. It is well, however, to remark in due credit to the chroniclers of these old practices that after having given a complete list of them the conclusion reached is "That they who in case of sickness do not rely on these popular remedies but consult the physician are blessed."⁴³ In conclusion let me say that while some critics think that the phylacteries and fringes used by the Jews during the prayer was a protection against the evil eye, I can not share in this opinion, for the reason that while women are the most susceptible to the evil eye, yet they are free from wearing them. Again, the reason given especially for wearing of fringes is so clear that we have no right to transplant the moral influence and substitute a superstitious element which, as already stated in the outset of this paper, is not to be found in the Biblical writings.

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VERHOEFF'S ASTIGMATIC CHARTS.*

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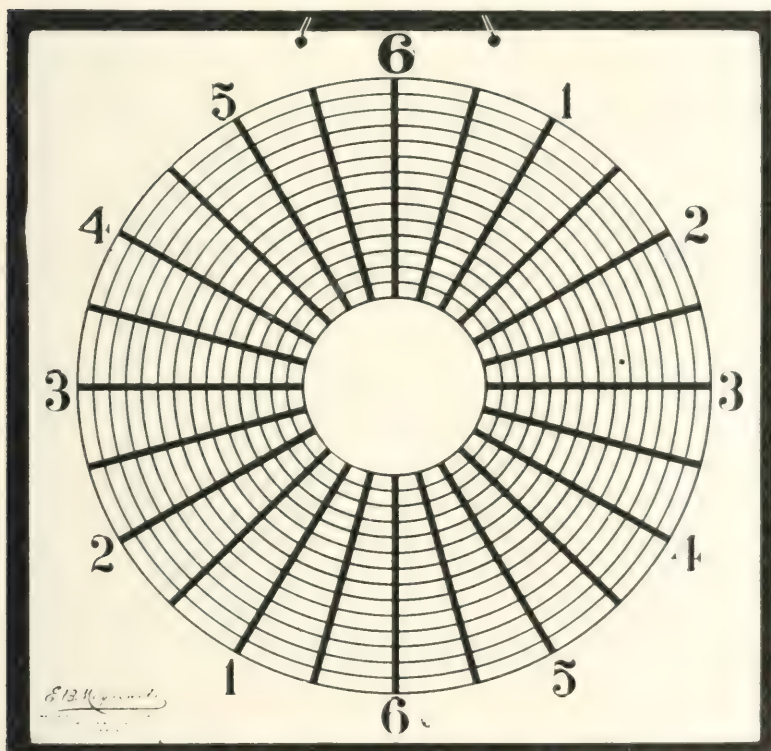
In the *Ophthalmic Record*, November, 1899, Dr. F. H. Verhoeff described two new astigmatic charts which differ in some important respects from the sun-ray figure, the various charts of Green and the radiating lines in groups of three of Wallace. One chart is intended solely for determining the axis, the other primarily for estimating the amount, of astigmatism. Chart 1 consists of a series of wide lines (width 3.75 mm.) radiating from a common center and placed at 15° intervals. These lines are crossed by concentric narrow lines (width 1.1 mm.), forming a series of circles separated from one another by equal intervals of 6.5 mm. The diameter of the disc is 31 cm. The wide radiating lines are designated by numbers 1, 2, 3, 4, 5, 6, corresponding on the right semicircle to the figures on a clock face and on the left semicircle to these lines extended. In the chart as published the vertical line above is marked 12, but this number has been replaced by 6 to secure uniformity and avoid confusion.

Chart 2 consists of a disc pivoted at its center to a square of white cardboard. Two wide lines (width 3.75 mm.) intersect at the center of the disc to form a right angle. Two sets of fine lines of varying lengths are drawn parallel to one of the wide lines and similar sets are drawn parallel to the other wide line in such a manner as to form a series of squares separated from one another by a uniform interval of 6.5 mm. Short marks on the white cardboard indicate axes from 0° to 180° at the usual 15° intervals.

In examining a patient without cycloplegia the lines are blurred with a suitable sphere, either + or —, in accordance with the spherical error in the case. The patient's attention is then directed to Chart 1 and he is asked to select the blackest or most sharply defined of the wide lines. The selection of this line is rendered easier by the fact that the fine lines crossing it are precisely the ones that are most blurred. Conversely, the wide line at right angles is seen to be especially blurred in contrast to the sharply outlined fine lines crossing it.

* Read before the Ophthalmic Section, St. Louis Medical Society, Feb. 13, 1907.

The patient is then directed to view Chart 2, which has been rotated to bring one of the wide lines in the axis as determined by Chart 1. This line will then stand out distinctly against the blur of the fine lines crossing it and, conversely, the other wide line will appear faint in contrast with the sharply outlined fine lines at right angles. Concave cylinders of varying strengths with axes at right angles to the sharp wide line are brought successively before the sphere until the patient is convinced that the two wide



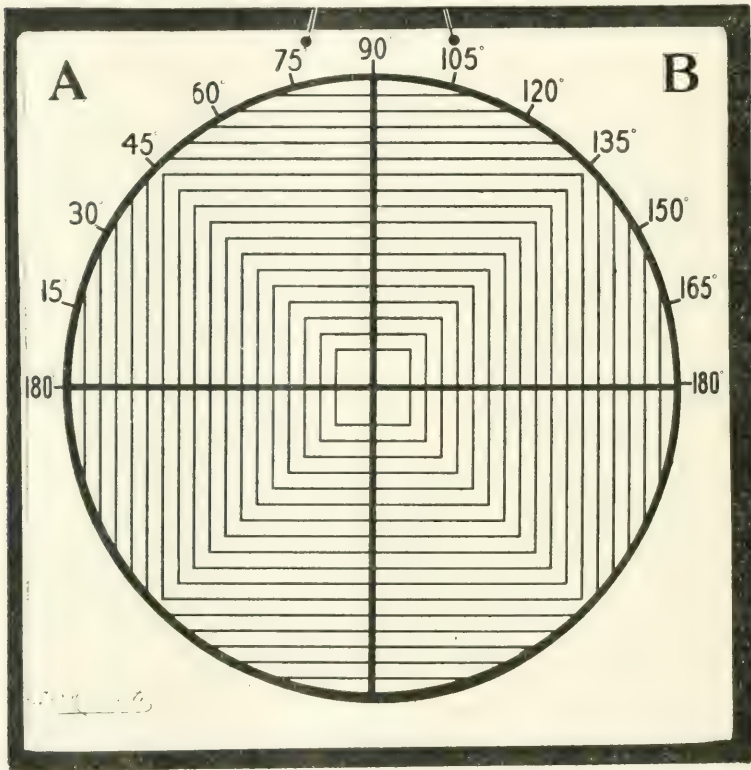
Verhoeff's astigmatic charts. Chart 1.

lines have been equalized. He is now asked to confine his attention to the quadrants of fine lines and is asked to state whether they, too, present a perfectly uniform appearance. As a rule, one pair of sections will be selected sharper than the other, despite the fact that the wide lines appear absolutely uniform. The addition of a $+$ or $-$.12 cyl. will almost invariably be all that is required to make the chart appear absolutely uniform.

At this point the patient's vision will be found in the neighborhood of 6 viii. The sphere is then altered to bring the visual acuity

up to normal or a little above. Finally, the patient's attention being confined to the lowest line of letters, it will often be found that these can be appreciably sharpened by a slight change in the axis of the cylinder.

Chart 2 may also be used for determining the axis of astigmatism by rotating the disc back and forth until the more distinct of the two lines reaches a position at which it appears most distinct to the patient. Another method, first suggested by Verhoeff, is to



Verhoeff's astigmatic charts. Chart 2.

rotate the chart until the two wide lines appear equally distinct. The axis will then lie half way between the two lines.

In using Chart 2 I have sometimes found it a little difficult (especially with children and unintelligent adults) to get patients to understand precisely what they are intended to look for. In such cases I have found it useful to compare the chart to a pie divided into four slices, and to ask whether the right and left slices are the blackest or the upper and lower ones. As a further aid toward

designating the lines or quadrants when the axis is away from the vertical Dr. Verhoeff has placed the letters A and B on the cardboard of the chart to the right and left. He has also found it of advantage to mount Chart 1 on a larger card than that furnished by the publisher in order to designate the lines by larger numerals.

Some patients find it very difficult to concentrate their attention on the quadrants of fine lines, being unable, apparently, to disregard the vivid impression of the wide lines. I believe that for such individuals a chart similar to Chart 2, but without the wide lines (the axes being indicated by inconspicuous marks at the periphery only), would be of value.

C. N. Spratt¹ has recorded the comparative results obtained with the use of the charts without cycloplegia and again after the instillation of homatropin 2 per cent. every ten minutes for a period of one and one-half hours. His report, based on the examination of 126 eyes, mostly in the young and middle aged, is as follows: In 75 per cent. there was no difference in the amount of astigmatism before and after cycloplegia. In 20 per cent. the astigmatism after cycloplegia was .25 D. (or less) greater than before cycloplegia. In four cases there was an apparent difference of .37 D. and in one case of .5 D. In the myopic cases 66 per cent. gave the same result before and after cycloplegia. Thirty-four per cent. were undercorrected from .12 D. to .37 D. without cycloplegia. In the hyperopic cases 42 per cent. were fully corrected without cycloplegia; the remainder were undercorrected from .12 D. to 1 D.

I have had these charts in daily use for the past two years and have found them eminently satisfactory, so much so that I have to a large extent discarded other charts. I am convinced they furnish us with the best subjective method of determining astigmatism as to axis and amount and are deserving of a wider use than has hitherto been accorded them.

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1. St. Paul Medical Journal, August, 1905.

THE RELATION OF THE EYE AND THE NOSE.*

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Within the past ten years the effect of nasal conditions on the eye has received a great deal of attention, especially in Europe, and our knowledge has advanced to such a point that the intimacy of this relation and its far-reaching effects must receive special consideration.

The relation between lacrimal blennorrhea and nasal inflammation has been recognized for many years. Seifert¹ in 1898 reported 38 cases of lacrimal blennorrhea in which nasal diseases were found in all but 7 cases, and in another series of 48 cases examined by him nasal disease was found in all. In 60 cases of lacrimal obstruction examined by me in 1906, but 50 per cent. showed appreciable nasal disease, and yet this does not of necessity preclude the fact that a greater number than 50 per cent. might have been originally caused by nasal inflammation. Mechanical obstruction of the nasal end of the lacrimal duct may be caused by congestion, enlarged inferior turbinates, crusts, spurs, and enlarged middle turbinates, which crowd down the lower turbinates. Tumors, ulcerations and cicatricial contractions must also be considered causative.

It is undoubtedly true, as Friedrichs² says, that "It is often difficult to determine at a single examination whether or not there is any connection between the nose and the eye, as the condition in the nose is much influenced by the presence of swelling, and the amount of the mucus is variable, especially in scrofulous patients, who furnish the bulk of the material." I have frequently had a lacrimal case referred back to me as negative by the rhinologist, who has at some further examination found nasal disease, or at least marked traces of former nasal trouble. Some rhinologists go so far as to say nasal disease is responsible for less than 10 per cent. of the cases of lacrimal blennorrhea. I believe the percentage to be above 50.

The phlyctenular conditions of the eye are almost invariably dependent upon nasal or postnasal disease. At the Massachusetts

* Read before the Indianapolis Eye, Ear, Nose and Throat Society, Nov. 25, 1907.

1. Münch. med. Wchnschr., 1898, No. 29.

2. Rhinology, Laryngology and Otology in General Medicine.

Charitable Eye and Ear Infirmary, where from 30,000 to 35,000 new cases are treated yearly, there is seen one case of phlyctenular involvement of the conjunctiva or cornea in every 37 cases. This clinic is rich in opportunity for the observation and study of this condition, and I have repeatedly demonstrated that practically every case is dependent upon nasal or postnasal disease. Local treatment of the eye combined with suitable hygienic measures will be sufficient in many cases to give an apparent cure, but it is usual to see these cases relapse after a varying period of time if the nose does not receive appropriate treatment, in conjunction with the ocular and general measures.

Scrofulous rhinitis of the purulent or muco-purulent variety is the most common etiologic factor. Adenoids, enlarged tonsils and hypertrophied conditions of the nose are also seen with great frequency. The vast majority of cases of phlyctenular involvement of the eye will continue to relapse just as long as the nasal or postnasal condition remains neglected.

Disease is transmitted from the nose to the eye in three ways: By way of the naso-lacrimal duct, through the blood streams, and by way of the nerves. Perhaps the most important of all these routes is the naso-lacrimal duct. Aside from the phlyctenular diseases alluded to above, many other inflammations originate in this way. Seifert³ reports many cases of spreading ulcer of the cornea in patients whose nose showed an atrophic rhinitis; Fuchs⁴ mentions ozena as a common complication of trachoma, while many authors assume a definite connection between trachoma and disease of the nose. I have constantly failed to find such connection except in so few cases that they must be considered coincidental. Transmission of tuberculosis from the nose to the eye has been observed by Fuchs,⁵ and I had under my care two cases of diphtheritic conjunctivitis which manifested a nasal diphtheria; which was the primary lesion in either case I am not able to state, as the membrane was present in both the eye and the nose when the cases came under my observation. That infection can spread downward toward the lacrimal canal as well as upward has been demonstrated by Miller,⁶ who repeatedly found gonococci in the diseased nasal mucous membrane of infants suffering from ophthalmia neonatorum.

There is an intimate relation between the vascular system of the nose and the eye; especially seen in the arterial anastomosis by

3. Münch. med. Wchnschr., 1898, No. 29.

4. Lehrs. der Augenheilk., p. 570.

5. Ibid.

6. Störk, "Nothnagel's Handb.," 13, 1, p. 86.

means of the ethmoidal arteries: by branching of the ophthalmic artery: and a collateral trunk along the naso-lacrimal duct. There is an intimate connection also between the veins of the lacrimal plexus, nose, face and orbit, besides the ethmoidal veins which run from the nose to the orbital and cranial cavities. Through this intimate vascular system, it can readily be imagined, pass many bacteria giving rise to secondary inflammatory conditions in the eye. Ziem⁷ has observed several cases of iritis which improved only after treatment of the nasal inflammation, and Kuhnt agrees with the observation of Ziem. According to the theory of Ziem, who lays great stress on the connections of the vascular system, it is possible for the whole uveal tract to become infected from the nose.

Haskell has had under observation two cases of typical monocular glaucoma which were relieved entirely by operation on hypertrophic conditions of the nose.* Haskell's cases may possibly be more properly classified under nervous reflex conditions, and yet the vascular connection seems more logical.

The fifth nerve supplies a portion of the nose through its nasal division, which explains the reflex sensations felt in the nose following irritation of the ciliary nerves, as, for instance, in inflammatory disease of the eye. Reflex nervous irritation from the nose to the eye is by far the most common. Siefert⁸ has described a ciliary neurosis due to nasal synechiæ following extensive cauterization of the nose. There is no doubt in my mind that reflex nervous irritation is the cause of severe symptoms of asthenopia. The asthenopia may be due to muscular insufficiency or to an apparently irregular contraction of the ciliary muscle. I have repeatedly examined patients whose astigmatism changed its axis three or four times during one examination. This, of course, was without the use of a mydriatic. In nearly all such cases there has been found nasal or accessory sinus disease, the vast majority showing a hypertrophic condition of the turbinates. Certain cases suffer from what Haskell calls a "potential contact," that is, a contact in the nose which is only present at times. On days in which the turbinates are not in contact with the septum the patient suffers no ocular symptoms. Other days when the nose does not offer free passage of air the ocular symptoms return. Such cases as these, even if the refraction is corrected by mydriatic test, can not wear their

7. *Mem. f. Ohi.*, 1893, p. 262.

* Since writing this paper, Griffin has reported two cases showing symptoms of glaucoma which were relieved by nasal treatment, *Journal A. M. A.*, Nov. 9, 1907.

8. *Loc. cit.*

glasses with comfort, and it is not until nasal obstruction is relieved, usually by operation, that the refractive error remains constant and the ocular symptoms disappear. Most of my cases showed this variation in the axis of the astigmatism on but one side and the nasal examination revealed most congestion and hypertrophy on the corresponding side.

Muscular insufficiencies are also caused by enlarged turbinates, spurs, deviations of the septum and other nasal conditions, but in the muscular cases we usually find accessory sinus disease. One case which I reported⁹ manifested an esophoria, varying from 6 to 60 prism degrees, which disappeared entirely after the removal of each enlarged middle turbinate and curettage of the anterior ethmoidal cells. Fish,¹⁰ in his study of 36 cases of optic neuritis, in which accessory sinus disease was found in 26, mentions muscular insufficiency as a marked and usual symptom. Posey¹¹ has also called attention to the numerous cases of muscular insufficiency caused by sinus disease. The great number of cases of irregularity in the muscle balance which show nasal or accessory sinus disease has led me to make the statement that patients suffering from muscular error should have a thorough nasal examination and treatment of the nasal disease, if found, before resorting to the use of prisms or before performing tenotomy or partial tenotomy for correction of these errors. The operative treatment of muscular insufficiency has given rise to more neurasthenics and less relief than any other form of ophthalmic treatment in recent years.

Laurens¹² reports a case of blepharospasm which disappeared after operation on nasal synechiæ and removal of enlarged turbinates. Bernstein¹³ reported improvement in errors of refraction after removal of nasal hypertrophies. There are many observers who report from one to a series of cases which confirm the close intimacy in many instances between the nasal hypertrophy and ocular disturbances.

Hypertrophic and polypoid changes in the nasal cavities most always accompany disease of the accessory sinuses which may in themselves cause similar symptoms to those already described. The ocular symptoms of acute accessory sinus involvement, in a measure, differ slightly from the symptoms caused by nasal obstruction *per se*. Headache, for example, is a usual symptom in accessory sinus trouble; it is most always unilateral; it does not depend

9. Boston Med. and Surg. Jour., March, 1907.

10. Journal Laryngology, Rhinology and Otolaryngology, September and October, 1907.

11. Ophthalmic Section A. M. A., July, 1905.

12. Ann. d'ocul., April, 1896.

13. Med. News, July 22, 1893.

upon use of the eyes; it is more severe in the morning than later in the day, and is greatly accentuated when the patient stoops for anything. A catarrhal history is usually elicited, but this is by no means necessary. The headache may be paroxysmal in character and simulate closely a migraine. Treatment of the nose with thorough drainage and possibly irrigation of the sinus will relieve all ocular symptoms. I am in the habit of referring all cases of monocular headache to the rhinologist, as, in a vast number of cases, they are due to nasal or accessory sinus disease.

Purulent sinus disease, especially of the frontal, causes various ocular symptoms by direct transmission of the infection to the orbital cavity. Kuhnt¹⁴ described the suppuration as attacking the bony wall of the sinus, then by means of small vessels (or necrosis) this infection is passed to the periosteum of the orbit, where it causes a periostitis or a subperiosteal abscess, which in time becomes an orbital abscess with exophthalmos, limitation of motion, pain, tenderness, etc. The condition may stop here by rupture forward or incision, or it may cause thrombosis of the central vein of the retina with subsequent panophthalmitis. Further complications may be extension to the cavernous sinus, brain or general pyemia. The extension may extend through the pterygoid plexus posteriorly or anteriorly to the facial veins with subsequent pyemia. Two cases have come under my observation with involvement of the cavernous sinus and subsequent pyemia, which had been treated by poulticing a supposed lid abscess until the patients were practically moribund. In both instances the primary infection was in the frontal sinus which had broken through the floor of the sinus into the orbital cavity.

Fish¹⁵ reports 36 cases of optic neuritis, 26 of which had accessory sinus disease. Treatment of the sinuses in the 26 cases gave improvement of the ocular symptoms in 15, including 3 binocular cases restored to normal. Another interesting point he brought out in his report of these cases was that the sinus condition in some instances was completely overlooked by the rhinologist, also that many ophthalmologists had treated the neuritis without avail for a number of months or years without determining the underlying cause. It is well to mention in this connection that sinus disease may cause a retrobulbar neuritis.

14. Ueber die entzündlichen Erkrankungen der Stirnhöhle und ihre Folgezustände, 1895.

15. Loc. cit.

16. Der Schnery und die Nebenholen Der Nase, 1907.

enoid¹⁹ shows a great number of anatomical dissections, which give the relation of the accessory sinuses to the optic nerve. They are more beautiful and more detailed than those of Killian. After describing minutely the close relation of these cavities to the orbit and optic nerves, he gives a résumé of the recent work on this subject and suggests many possible lines of investigative work. He especially laments the dearth of accurate postmortem reports of these cases, the pathologist having been content to tell the conditions found without attempting to trace the paths along which the infection spread.

From the anatomic positions of the accessory sinuses it can be seen how readily infectious processes pass from them to the orbit. The os planum of the ethmoid, which is very thin, forms the inner wall of the orbit; the floor of the frontal sinus forms part of the upper wall of the orbit, and it is this sinus which involves the orbit more often than any of the others. Beneath the floor of the orbit is the antrum, or maxillary sinus, but disease of this sinus does not often involve the eye by direct infection, the ocular symptoms accompanying empyema of the antrum being more of a reflex nature. The sphenoid sinus does not often come in contact with the orbit, but it may, and under such circumstances the dividing wall may be so thin as to offer the line of least resistance to the advancement of purulent disease. The bony walls dividing the orbit from the sinuses are usually of good strength, but the study of a number of anatomical specimens of this region will reveal extremely thin walls in some cases, or walls which are partly deficient in bony tissue. I have collected 19 cases of frontal sinus empyema admitted to the Massachusetts Eye and Ear Infirmary, all of whom applied for admission because of the ocular condition alone. All the cases complained of monocular pain and tenderness, most showed displacement of the eye down and out, with limitation of motion. Nearly every case was treated by radical sinus operation externally. Not one of the cases showed optic neuritis or retrobulbar neuritis, including the two cases that had extension to the cavernous sinus and died of pyemia.

Empyema of the ethmoid and antrum will almost invariably rupture into the nasal cavity, so that most cases of orbital abscess due to accessory sinus disease are tracable to the frontal sinus, the remaining few being due to the sphenoid and rarely the ethmoid.

Empyema of the lids and orbital tissue is due to fracture which involves the nose or its accessory sinuses and in this way allows air to enter the tissues.

Various ocular manifestations of nasal and accessory sinus disease have been recognized by competent observers everywhere, but there remains much to be accomplished along similar lines, and every ophthalmologist must consider the nose as a possible source of trouble in many instances.

I do not wish to assert that treatment of the nose in itself relieves the ocular conditions. It will only be a valuable adjunct to the local treatment, and if properly investigated will reveal the true cause of many otherwise obscure ocular conditions, and puts into our hands the means of relieving symptoms through their true cause.

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Abstracts from Recent Ophthalmic Literature.

ANATOMY.

THE ANATOMY OF THE SO-CALLED LIGAMENTUM PECTINATUM OF IRIDIS AND ITS BEARING ON THE PHYSIOLOGY AND PATHOLOGY OF THE EYE.—HENDERSON, THOMAS, Nottingham. (Report of November, 1907. Meeting of the Ophthalmological Society of the United Kingdom. *The Lancet*, Nov. 23, 1907.) The writer stated that the so-called pectinate ligament was a part of and belonged to the sclera. The principle on which it was constructed was perfectly simple, being exactly the same as that which obtained in the fibers of the neighboring tissue in which it lay, as an open network, composed of non-sclerosed interlacing fibers, which were in direct continuation with the circular and longitudinal bundles of the sclera surrounding the venous sinus of Schlemm's canal. The circular fibers were made out in tangential and transverse sections of the pectinate ligament, while the longitudinal fibers were seen in radial sections. The criterion of a true radial section was that it showed the anatomical connection and continuation often suggested, but hitherto never yet demonstrated, of the hyaline layer of the ciliary body with posterior limiting layer of the iris.

Arising as a continuation of the innermost lamellæ of the cornea, the pectinate ligament should be divided into (1) a small outer or scleral portion, where fibers at the posterior end of Schlemm's canal became lost in those of the sclera, and (2) an inner larger or ciliary division, which could be still further subdivided into (a) a portion which pierced the scleral ring to give attachment to the meridional fibers of the ciliary muscle, (b) a part which passed internally to the scleral ring to terminate in the connective tissue stroma of the circular portion of the ciliary muscle. None of the fibers of the ligament turned round into the root of the iris, as was described, but this appearance was the result of an oblique section and emphasized again the importance of studying only true radial preparations. The iris root was attached to the circular bundles of the ligament at a point just posterior to the scleral ring, which attachment to the ligament was quite a different matter to fibers of the ligament being said to bend round into the iris, which they did not.

He considered that the term *ligamentum pectinatum iridis* was thus not only altogether inappropriate, but also wrong and mis-

leading, as in man it was neither a comb-like structure nor was it a ligament to the iris. On this account, and because of its retiform or cribriform structure, and, further, on account of it being a ligament in the true sense of the word to the two portions of the ciliary muscle, the term "cribriform ligament of the ciliary muscle" was much more appropriate.

This ligament showed a most marked histologic difference in its structure and nature at different periods of life. In youth it was cellular, while as age progressed it became more and more fibrosed. It was this physiological sclerosis in excess that he considered was the fundamental *causa causans* of primary glaucoma, in the causation of which two factors must be separated—the one constant, the other accessory. The first and constant factor was sclerosis of the filtration network and a consequent diminished outlet. The second and variable agent was vasomotor in nature, and it was this which determined the acute attack, in which there was superadded to the first an inflow out of proportion to the available and already reduced channels of exit from the eyeball.

Viewed in this light, all the phenomena of glaucoma, clinical and pathological, could be explained. A closer study of this sclerosis of this filtration network gave a clear view of the process of development, and stages of formation of connective tissue, with definite histologic proof that white and elastic tissue was not a direct conversion of the cell protoplasm, but was derived indirectly from alteration and transformation of a homogeneous substance which was itself the product of cellular activity. The alveoli of the filtration network were connected with the lymph spaces of the cornea and sclera, whose fixed corpuscles were brought into direct association with the endothelial cells of the anterior chamber. It was in consequence of this anatomical continuity that the cornea, by diffusion, received its nourishment from the aqueous. This fact would explain a great deal, and would have the utmost bearing on the pathology of corneal diseases.

C. H. M.

ANOMALIES.

COLOBOMA PAPILLÆ NERVI OPTICI WITH NORMAL VISION.—VAN DER HOEVE, J. (*Tydschr. v. Gen.*, Nov. 10, 1906), examined a recruit, 19 years old, who squinted from infancy with his left eye; he never had been well with that eye, although it never troubled him; he considers his right eye normal. The left eye squints externally and possesses a coloboma of the iris downward; central fixation with visual acuity 5/1, no improvement with lenses. although a corneal astigmatism of 2.5 diopters exists. Ophthal-

moscopically a coloboma chorioideæ et nervi optici is seen. The coloboma of the lens was a saddle-formed excavation of the lens, with some small opacities in the neighborhood; no zonula-fibers nor prominences of the corpus ciliare could be seen; only a small pigmented piece, which seemed to come from the temporal side of the iris root, projected in the coloboma. In the vitreous body there were some filiform opacities. The central vessels appear very irregularly dispersed. The visual field shows a defect for white and colors, corresponding with the chorioidal coloboma, which includes Mariotte's spot, which could not be separately demonstrated.

The right eye does not show external abnormalities, vision 5/iv. At the place where normally the papilla is found a clear white spot is present, partly bordered with pigment, around which is a partial atrophic chorioidal ring; it is about nine times the size of normal disc. The fundus is emmetropic, while the white spot is two diopters myopic and possesses three places, one of the nasal side downward and one upward and one temporal upward, which are about seven diopters myopic. The vessels appear pretty regular, partly at the margin of the white spot, partly from out the deeper places. In the coloboma there are some faintly visible vessels, which show marked parallactic displacement with the vessels at the margin. The macula is not clearly defined; above the coloboma a vena vorticiosa is visible. The visual field for white is normal, with a large defect to the temporal side of the fixation point corresponding with the white spot. It seems therefore that here only a coloboma of the optic nerve exists. Continued examination of the visual field showed, however, that the inferior parts of this eye were not normal, as, although the field was normal for white, the inferior part of the retina was insensible to colors. The central color sense was normal.

The only defect common to both eyes were small corneæ, the horizontal meridian was 10 mm. in the right eye and also in the left, the vertical meridian 9 mm. in the right and 10 mm. in the left eye, which should normally be 11.5 and 11 mm. The radius of the cornea was about normal, in the right eye 7.7 in the horizontal and in the vertical 7.5, which was in the left eye 8.3 and 7.8 mm. Patient was a compositor and lithographer and has no difficulties as marksman.

The mother has a double-sided coloboma of the iris, one of the patient's sisters also one in the left eye, which eye is very small and converges strongly; she considers her right eye normal. Father, brother and three other sisters do not show ocular defects.

which are also not supposed to exist in the family of the mother. The rest of the family could not be examined. E. E. B.

THE EYE OF ALBINOS.—LAGLEYZE (*Archives d'Ophthalmologie*, July, 1907). This paper concludes the series of articles on the subject.

Partial absolute albinism of the eye occurs in both eyes or is limited to one or to a part only of one. Complete absence of pigment in all the membranes of the eye in a healthy subject has not yet been recorded. A few cases have been reported in which a portion of the iris and even of the chorioid and retina were completely without pigment. Nettleship reports several cases of albinism of the fundus in connection with nystagmus, ametropia and diminution of vision without absence of pigment in iris, eyebrows or cilia, and Muller reports a similar case.

Partial incomplete albinism is manifested by a congenital diminution of pigment of one eye relatively to the other. If the pigment is distributed unequally in the same eye, one part harmonizes with the general coloring of the subject, the other part being lighter.

The anomaly corresponding to this variety of albinism is that characterized by a difference of color of the two eyes. This is very frequent among animals—the “oeil vairon” (wall-eyed) of the French. Various names have been suggested to designate it in man. The author prefers that suggested by Malget—chromheteropia. For cases in which there are two colors in one iris he prefers the name of heterochromic iris. The pathologic histology of chromheteropia has shown that the anomaly is due to diminution of pigment in the light iris; though certain cases may be due to exaggerated pigmentation in the darker eyes, which is not in accordance with the pigmentation of the skin and hair. Jessinko reports a case of chromheteropia which he calls nigrism of the iris.

In partial incomplete albinism, all the functions of the eye are normal. Some authors think that heredity has a strong influence, but the author has not been able to confirm this.

It seems that individuals affected with partial albinism have a tendency to become prematurely gray. Several authors have also determined that the less pigmented eye is peculiarly liable to be affected prematurely with cataract. According to Malgat, the lens inevitably becomes opaque, and it is generally supposed that the eye with deficient pigmentation is especially predisposed to various pathologic influences. Weill maintains that the deficiency of color of the iris is a symptom of disease. He has found traces of uveal

inflammation and thinks that the albinotic eye is affected with latent uveitis, which is the cause of cataract. The author is inclined to the opinion of Malgat, who attributes chromheteropia to vascular disturbances in the embryo, and thinks that hereditary syphilis may be a cause of these disturbances.

Vries is inclined to believe that chromheteropia is acquired and is of pathologic origin. Galvanization of the sympathetic is said to cause a change in the color of the iris. According to Fere, difference in the color of the iris is a very frequent stigma in neuroses and is frequently met with in idiots and epileptics.

Among the pigmentary alterations of the iris, one or several rusty spots, varying from red to intense black, are frequently noticed and are due to groups of exaggerated pigmentation in the anterior layer of the iris. They have been mistaken for additional pupils. Markings due to excessive development of anatomic elements of the iris are also met with, and these two forms of alterations combined form figures resembling letters or numbers. Of the famous case in which Napoleon was said to be read in one eye and Emperor in the other, Geraudes said: "It was simply one of those odd combinations which, with the aid of a strong desire, permits you to find this inscription."

G. C. H.

BACTERIOLOGY.

THE BACTERIOLOGIC ASPECTS OF THE PROBLEM OF NEUROPATHIC KERATITIS.—DAVIES, H. MORRISTON, and HALL, GEORGE (*The British Med. Jour.*, Jan. 11, 1908). The writers call attention to the many hypotheses used to explain the cause of neuropathic keratitis, giving an outline with the arguments for and against, taken from Wilbrand and Saenger. These hypotheses include: (1) The purely trophic, (2) the trophic traumatic, (3) the trophic with peripheral irritation, (4) the vasomotor, (5) the vasomotor traumatic, (6) the purely traumatic, (7) the desiccation, and (8) the mycotic.

They then give the results of bacteriologic investigations based on the examinations of 21 clinical cases. All these cases had the Hartley-Krause operation performed for trigeminal neuralgia; 11 of them developed neuropathic keratitis, whilst the other 9, up to the time when they were last seen, showed no affection of the cornea. Sir Victor Horsley undertook, by a series of operations on animals, the investigation of the pathogenic properties of that organism which was found to be constantly present only in the eyes of patients affected with keratitis.

Several different micro-organisms were found in all 21 cases; but there was one bacillus (called for the present X bacillus) which

was found only in those eyes which showed neuropathic keratitis, resembling the pseudo-diphtheria bacillus, but differentiated by the following three points: the X bacillus shows occasional granule formation, gives no naked-eye growth on potato, and does not render bouillon turbid.

The conclusions are: The bacillus X was found present in 30 per cent. of normal people; it was present in the conjunctival sac of all those patients who had neuropathic keratitis, and among the epithelial cells at the margin of the ulcer of the excised eyes; it was not found in those cases which did not develop keratitis after excision of the Gasserian ganglion. The presence of the bacillus in the sac is, therefore, necessary for the production of neuropathic keratitis, but its presence without an associated lesion of the Gasserian ganglion does not lead to keratitis. There is, however, a third factor necessary for the production of keratitis after excision of the Gasserian ganglion, and this is prevented from acting by closure of the lids. For the production of neuropathic keratitis three factors must be present: (1) Removal of the Gasserian ganglion, (2) the presence of the bacillus, (3) a factor of undefined nature dependent on the eyelids and removed by closing them. The first and second are not adequate alone, as suture of the lids prevents or cures neuropathic keratitis; the first and third are not adequate alone, because, as was shown, keratitis only occurs after destructive lesions of the Gasserian ganglion when the organism is present, and in the same proportion of patients as that in which the organism occurs in normal persons.

G. H. M.

A SERIES OF FOUR CASES OF INFANTILE GANGRENE OF THE CORNEA IN WHICH THE TREPONEMA PALLIDUM WAS FOUND.—STEPHENSON, SYDNEY, London (*The Lancet*, Dec. 28, 1907). The writer points out that it is singular that although the treponema pallidum has been found in syphilitic lesions in almost every part of the body, yet specific ailments of the eye appear to form almost an exception to the rule. At all events few reports are to be found in literature concerning the treponema in those diseases which are among the commonest affecting the eye. This paucity, however, is more apparent than real. It is due partly to the inaccessibility of the lesions, involving, as they mostly do, the deeper parts of the eyes, and partly to the fact that ocular pathology has become almost as much a specialty as ophthalmic surgery itself, with the consequence that lesions of the eye do not as a rule receive as much attention from the general pathologist as would otherwise doubtless be the case. At the same time there can be little doubt, if any, that

in the eye, as elsewhere, the organism is the cause of all the so-called specific lesions with which we are clinically familiar.

He reviews the scanty reports of the finding of treponema in syphilitic affections of the eye and then gives details of four examples of keratomalacia, in all of which the *Spirochaeta pallida* was found in smears from the necrotic corneae when stained by the Giemsa and the Proca-Vasilescu method, the latter yielding the clearer microscopical pictures; this finding was useful in one of the cases when the syphilitic nature of the process was not of an altogether conclusive nature. He calls attention to the fact that spirochaetæ have been found in the tissues (cornea, iris and ciliary body) of seemingly unaffected eyes of syphilitic fetuses and babies by a number of observers; this raises the question whether the spirochaetæ seen and described in the present communication would not have been found in the cornea of the patients, apart from the existence of keratomalacia.

C. H. M.

A NEW PATHOGENIC MICRO-ORGANISM OF THE CONJUNCTIVAL SAC.—MCKEE, HANFORD, Montreal (*Ophthalmic Record*, October, 1907), has discovered a new micro-organism which he has found productive in nine cases of conjunctivitis. This conjunctivitis is characterized by free secretion which gums up the lashes, inflammation of the palpebral conjunctiva and very slight injection of the bulbar conjunctiva. Smear preparations of the conjunctival discharge which are stained by Gram's stain with a counterstain of safranin show tiny bacilli which are short and thick with rounded ends, giving the appearance of elongated cocci. They are occasionally found in groups but seem to lie preferably singly. They are found both within and without the leucocytes. From culture the bacillus seems to be slightly larger and tends to appear as a diplo-bacillus. It is short and thick with very pointed ends, is 0.5-2.0 microns long by 0.3-0.4 microns wide. It shows uniform stain, has no capsule, is non-motile and does not form spores. It is decolorized by Gram's stain, but stains well with weak solutions of carbol fuchsin or methylene blue. Its cultural characteristics are that it grows only at the body temperature and is aerobic. It grows best upon hemoglobin-agar of 1.0 and 1.75 acid reaction. In commensal relationship with the staphylococcus albus the bacillus grows well. The bacillus resembles somewhat the bacillus of influenza, but differs from it widely on media, viability and pathogenicity.

M. B.

OCULAR GLANDERS: EXPERIMENTAL RESEARCHES ON THE GUINEA-PIG. — DUFOUR (*Annales d'Oculistique*, August, 1908).

thinks that human glanders may not be so rare as it is generally considered, as it is probably often not recognized, particularly in the chronic form. In a number of cases in which autopsy has shown glanders, pneumonia, influenza, arthritis, etc., had been diagnosed.

A large proportion of the cases published have not presented any ocular lesion. Of nine published cases in which the eye was concerned, eight presented ocular lesions, and in one, without these lesions, the conjunctiva seemed to be the point of entrance of the infectious virus.

Romer and Hirota placed fluids containing pathogenic micro-organisms in the conjunctival sacs of animals and found that though they had disappeared in a short time, the animals died of generalized affections. They say that this absence of bacilli in the conjunctival sac is not due, as some have thought, to disinfectant action of the tears, but to the fact that the movements of the lids and the flow of tears forced the bacteria from the conjunctival sac into the nose where the organisms were found. With certain kinds of bacteria, general infection results more rapidly from instillation in the conjunctiva and passage to the nose than from subcutaneous injection.

If the lacrimal sac is destroyed and the lacrimal canals obliterated, general infection is often escaped. These authors conclude that very often, if not always, an infection that appears to be produced by the conjunctiva in reality enters by the nose. Local ocular lesions in glanders are rare.

After experimentation with a number of guinea-pigs, the author concludes that in a large majority of cases, if not in all, the guinea-pig that receives the glanders virus in the conjunctiva becomes infected and dies in about three weeks. That there is not always a local ocular lesion, but this appears when the bacilli are numerous and virulent, and consists of an intense conjunctivitis with an extensive ulceration of the cornea and abundant purulent secretion. It is the rule to find the bacillus of glanders—the *Corynebacterium mallei*—in the secretion a few days after the infection, in connection with the common micro-organisms. Death is caused by general infection or by intoxication, causing the animal to fall into a kind of marasmic condition. It is rare to find internal purulent foci.

G. C. H.

CATARACT.

THE DEVELOPMENT OF ANTERIOR POLAR CATARACT.—TERTSCH, Wien (*Graefe's Arch.*, B. lxi, H. 3, September, 1907), concludes that:

1. In young subjects polar cataract can rapidly develop after perforation of the cornea. Probably a mechanical separation of the lens fibers from one another and an elevation of the epithelium of the capsule are favoring factors in its production.

2. It has been demonstrated by a number that polar cataract can result from a peripheral perforation of the cornea.

3. The mode of origin and the first phases of the development of a polar cataract are dependent upon the severity of the infection with its related disturbance of nutrition of the lens. We find in those cases where, as the result of a severe infection, a purulent iridocyclitis has resulted, that usually after an extensive degeneration of the epithelium an exuberant regeneration follows from which a polar cataract may originate; whereas in cases where the uvea is not involved but only a mild irritation of the lenticular epithelium results, a polar cataract begins without previous destruction of the epithelium.

4. Disintegrated cortical fibers are found within the epithelial growth in those cases where a marked disintegration not only of the epithelium, but of the cortical layers has taken place, because after the preceding degeneration the marked regeneration is accompanied by proliferation of the epithelium which throughout a great extent infiltrates the broken-down cortex and encloses it.

5. In a case of non-perforating ulcer complicating ophthalmia neonatorum with normal epithelium a cortical cataract only can result. Still it is possible that later, after preceding disintegration of the epithelium, the regeneration of this can produce a polar cataract. In animal experimentation, changes in the anterior pole of the lens occurred only after severe iridocyclitis with exudate into the anterior chamber. These changes consisted mostly of an elevation and degeneration of the epithelium and of the cortical fibers. Only in one case, where the bacillus typhosus was injected directly into the anterior chamber, did polar cataract occur.

W. Z.

THE OPERATIONS FOR THE ARTIFICIAL MATURATION OF THE IMMATURE SENILE CATARACT. —POOLEY, THOMAS R., New York. (*N. Y. Med. Jour.*, Dec. 14, 1907). This paper commences with a very brief description of the various methods of artificially ripening immature senile cataract: 1, Simple discission of the anterior capsule; 2, discission combined with iridectomy; 3, discission and external massage; 4, iridectomy and external massage; 5, iridectomy and internal massage; 6, simple paracentesis with internal massage; 7, simple paracentesis with direct massage; 8, Jœcq's in-

jection, by the Pravaz syringe, of fluid beneath the anterior capsule: 2. a method recently practiced by Claiborne, a modification of Mooren's.

The operation is considered to be contraindicated in the following forms of cataract: Slowly sclerosing lenses with few striae, posterior polar cataract, and slowly forming cataract in myopic eyes, as well as all those cases where there is any indication of luxation of the lens, as shown by tremulous iris. And it is further suggested that before any ripening procedure is undertaken we should be sure that the tension is normal and the pupil dilatable.

The writer concludes as follows: "If, now, we take into consideration the uncertainty of obtaining success in bringing about a complete opacity of the lens by the methods which I have enumerated, the probable thickening of the capsule which may result therefrom, thus rendering the success of the subsequent extraction less favorable in securing good vision, together with the dangers and complications which may ensue, and still further, that a good many operators are no longer possessed of the fear, which they so long entertained, of operating upon immature cataracts, we shall feel like falling in with the wise conclusion made by Knapp when he says, 'many operators, the present writer included, prefer the risks of removing an immature cataract to any ripening operation'."

C. H. M.

THE OPERATION OF IMMATURE SENILE CATARACT.—AMOS, A. R., Des Moines (*Iowa Medical Journal*, Nov. 15, 1907), says the first consideration governing operation should be the age and state of health of the patient. He thinks that because of lack of sufficiently successful methods of maturation there is a growing opinion in favor of doing at once the extraction, using every means to clear out the soft cortex. The value of the Indian method in immature senile cataract will be determined only by testing it further. While in persons over 60 years of age there seems to be generally no question as to operation on double immature cataract, when advanced far enough to interfere with normal activity, in those under this age, there is much hesitancy. There must be considered the patient's urgent need of his vision, the possibilities of success, and, especially, whether the case is one of delayed or retarded development. He reports five cases of immature senile cataract in which he operated. Secondary cataract developed in four cases, but in all final visual results were good, 6/v vision being obtained in one after proper correction.

M. D. S.

THE CATARACT OPERATION.—HEATH, F. C., Indianapolis, Ind. (*The Lancet-Clinic*, July 20, 1907). The general condition of the patient should receive careful attention. The bowels should be emptied thoroughly the day before the operation, the patient bathed and clean clothes given both for the person and his bed. Lacrimal disease and conjunctivitis must be cured or eradicated. Just before operation the lids and face should be washed with green soap, with special attention to the lashes. The writer has all the instruments boiled but the cataract knife, the blade being held in boiling hot water for one minute. Three or four instillations of about 10 per cent. cocain, three or four minutes apart, are used. The solid plate speculum worked with a screw instead of a ratchet is most satisfactory. The fixation forceps should have a catch easily worked. The special capsule forceps used by Collins and some others has not been very generally adopted on account of danger of dislocating the lens. The author's method of operation is described in detail and other methods mentioned. The advantages and disadvantages of a conjunctival flap are considered, and the author inclines toward dispensing with it. In making the iridectomy the eyeball is steadied by the operator with fixation forceps, an assistant clipping the iris. As much lens matter as possible should be removed, at times passing the spoon into the anterior chamber, manipulation being less dangerous then to leave in the lens matter, which forms so favorable a culture medium for germs (Lawford). Mild iritis often following cataract operation is usually controlled by atropin and hot applications. Dionin relieves severe pain. The writer has saved two cases of suppuration by frequent irrigation, cauterizing wound, and the use of iodoform, argyrol, atropin and hot applications.

M. D. S.

NOTES ON CATARACT OPERATION.—SKEEL, FRANK D., New York City (*American Medicine*, November, 1907), says that in making the section if the aqueous should escape before the edge of the knife has passed the pupillary margin, allowing the iris to fall over it, the latter may be saved from injury by advancing the knife slowly, cutting first with the point, then with the blade near the shank. A capsulotomy, circular in shape is preferred. The writer describes his method of removing the lens and of making a symmetric coloboma. His speculum, which can be instantly removed, having one thumb-piece attached to a locking lever, is illustrated. In soft cataract he makes the section with the keratome just outside the normal pupillary space, the capsule, if not too tough, being opened at the same time. The keratome having been advanced exactly in the plane of its blade on entering the cornea, is then

slightly withdrawn and depressed to allow the aqueous to assist in the expulsion of the soft lens matter. In case of the lens being flocculent or gelatinous, a grooved or bent spatula is introduced and normal salt solution is directed upon the spatula from a syringe at the point where it enters the wound. The fluid will follow the curve of the spatula, creating a brisk current in the anterior chamber, and will flow out again, bearing with it the lens matter. If the lens is in a flocculent condition this method will remove all of it; if gelatinous, it will be necessary to introduce the spatula and disintegrate what remains.

M. D. S.

OPERATION FOR SENILE CATARACT.—DEAN, F. W., Council Bluffs (*Iowa Medical Journal*, Nov. 15, 1907), states his reasons for preferring the simple operation and emphasizes the importance of careful preparation of the patient. In these cases where the iris has rolled up before the edge of the knife he has withdrawn the blade from the counter puncture and, with the point still in the anterior chamber, has extended the incision along the temporal side of the cornea until well beyond the pupil margin, then passing the point between the iris and cornea and out through the old counter, finished the incision. In one case, being unable then to pass the pointed blade between the iris and cornea, he withdrew the knife, broke off its point, then finished the cut. A Z-shaped incision is made in the capsule. If parts of the lens are left they are removed by suction. This method is recommended for immature cataracts.

The author reports a case: Mrs. D., aged 82. Extraction was easily accomplished by the simple method. Twenty-four hours later the condition was good except anterior chamber had not refilled. On the third day the wound was entirely closed, but the iris looked sluggish and the cornea hazy and wrinkled. He made a small oblique opening through the cornea, and with a lacrimal syringe injected normal salt solution, not washing out, but filling the anterior chamber completely and replaced the bandage. Eight hours later the anterior chamber was still full, and any suggestion of inflammation had disappeared. Recovery was complete, with vision after correction, Jaeger 1 and 20/xxx.

M. D. S.

SIXTY-ONE EYE OPERATIONS IN ONE DAY.—GIDNEY, HARRY (*The Indian Medical Gazette*, December, 1907). These operations consisted of the following: Extraction of senile cataracts, 52; extraction of congenital cataracts, 6; iridectomy, 2; pterygium, 1.

The writer's tests, as to the suitability or otherwise of an eye for an operation, are the following:

1. The cataract must be mature or all but mature.

2. The tension must be normal or very nearly so.
3. The lacrimal sac *must* be healthy.
4. The pupil must react to light and darkness.
5. If possible, a healthy conjunctiva.
6. Chronic bronchitic and asthmatic cases are not operated on unless absolute rest after the operation is assured.
7. Very marked anemic cases are not operated on.

The eye must answer to all these tests before an operation is performed. When unhealthy the lacrimal sac is extirpated and when the eye is free from infection the cataract is extracted.

Out of these 61 operations he did 10 intra-capsular extractions with an escape of vitreous in only 1 case. In the others he lacerated the capsule and cut out a fairly long conjunctival flap. His rule is *never* to do an intra-capsular extraction unless the case is a suitable one for this operation, and, what is very important, unless he is sure that the patient can enjoy *absolute* rest for three or four days at the very least.

A conjunctival flap is indispensably necessary in cases where absolute rest can not be depended upon, and many of his cases have walked or driven from five to fifteen miles a few hours after their eyes have been operated on.

It is his practice never to cut a conjunctival flap, in intra-capsular operations, for the following reasons: (1) Such a flap is not so necessary when absolute rest can be obtained. (2) If after the extraction of the lens in its capsule blood from the cut conjunctiva enters into the anterior chamber it is not always entirely absorbed, with the result that vision is sometimes seriously impaired. (3) If there be an escape of vitreous and blood then enters the eye, its admixture with the vitreous is not at all desirable. In fact, that should be prevented at all costs. (4) As irrigation of the anterior chamber is not necessary in intra-capsular extractions, one has no other means of getting rid of any blood that has trickled into the eye. It is on these grounds that I consider a conjunctival flap to be not only unnecessary but a drawback when made in intra-capsular extractions.

He does not irrigate the anterior chamber when operating in the mofussil, believing it a dangerous procedure unless practiced in an institution which possesses highly trained assistants, and where the operator can rely on all the lotions being aseptically prepared.

In connection with irrigation of the anterior chamber the position of the head is of great importance. He has not seen this mentioned by any of the advocates of irrigation, viz.: (a) The chin

should be depressed so that the face slopes downward toward the chin. (b) The head should be slightly turned toward the side being operated on, and the nozzle of the irrigator should be inserted from the side of the eye and not from above: with the head in this position, all the saline solution after it has regurgitated from the anterior chamber, flows outside of the orbital cavity and there is no chance of it re-entering the eye, after it has once come into contact with the conjunctiva or any conjunctival secretions which might be present, especially if strong mercurial lotions have been used for disinfecting the eye.

The patients are prepared for operation by an assistant, who cuts the eyelashes, washes the face with soap and water, and irrigates the conjunctival sac with 1-3000 perchlorid.

The after-treatment is left to trained assistants, who see the patients daily. Atropin (2 grs. to 1 ounce) is inserted into the eye (except in intra-capsular extractions) immediately after the operation, and orders are issued for the drug to be used daily, so as to keep the pupil well dilated for at least a week.

After operating in a place where there is no indoor ward attached to the dispensary, the patients are made to lie down on the floor, benches, etc., for three or four hours. At the end of this time the conjunctival flap is fairly strongly united, and they are carried or led away, with instruction to come back the next day. In intracapsular extraction, and more so when vitreous has escaped, absolute rest is insisted on. Given an eye operated on for cataract, in which everything has gone smoothly, and a long conjunctival flap has been made, it makes very little or no difference in the after-result of the case whether the patient rests for some days or goes away to his village a few hours after the operation has been performed.

In regard to the result of these 61 cases, Captain Gidney has personally seen many of them, and the assistant surgeon has reported that all the cases, except one old woman, were doing remarkably well and could see well and clearly.

F. A. and P. G.

EXTRACTION OF CATARACT IN THE CAPSULE; REPORT OF A VISIT TO MAJOR HENRY SMITH IN JULLUNDER, INDIA.—KNAPP, ARNOLD, New York (*Arch. Ophth.*, January, 1908, xxxvii, 1), gives the results of his observations on the extraction of cataract in the capsule as observed on a recent visit to Major Henry Smith in Jullunder, India. About 3,000 extractions were done at the Jullunder General Hospital during the past year, 50 extractions often being done in a single morning. Knapp witnessed 104 extractions, and states

that nearly all of these were done without iridectomy. The early closure of the wound was noticeable. The result was a black pupil, freedom from iritic irritation and adhesions. Partial prolapse of the iris and incarceration was observed in 17 cases. Escape of vitreous in 3; slight escape of vitreous in 10; suppuration in 2; hemorrhage (subchorioidal) 1. The writer refers to the advantages that follow this method of operating, but adds that "the difficulty of properly replacing the iris, owing to the greater chance of prolapse of vitreous, with the possibility of subsequent inflammatory dangers from incarceration, may be a fault of the method."

W. R. M.

EFFECT OF PRESSURE ON THE HEALING OF THE CORNEAL INCISION AFTER CATARACT EXTRACTION.—JACKSON, EDWARD, Denver, Colo. (*The Ophthal. Review*, November, 1907). The writer calls attention to the fact that in the normal eye the sclerocorneal coat is distended by the intraocular pressure, and that the corneal section for cataract extraction reduces this intraocular tension to zero. The relations which the two lips of the wound take to each other in healing are determined during this period. The incisions usually practiced cut the sclerocorneal coat more or less obliquely. Since the intraocular pressure after extraction is zero, the external pressure must be excessive; even the weight of the lids resting passively upon the eyeball forces together the oblique lips of the wound and produces overriding of the anterior or upper lip.

"The important, practical deduction from this theoretical consideration of the relation of the lips of the cataract incision is that *pressure upon the eyeball should be carefully avoided after cataract extraction*. Even harmful pressure can not secure, or greatly assist, fixation of the eyeball. But very moderate pressure can be harmful by causing such displacement of the flap as will interfere with smooth healing. Fixation of the eye and rest of the parts are favored by closure of the fellow eye and guarding against startling the patient by sudden noises. A dressing in light contact with the lids keeps them closed and favors quiet of the eye by reflex influence. But the bandage, which can not retain its position unless it makes some pressure, should be discarded after cataract extraction."

C. H. M.

THE INCONVENIENCE OF TOO VIGOROUS IMMOBILIZATION AFTER CATARACT OPERATION.—ROUNE (*Annales d'Oculistique*, March, 1907). The author has observed in a certain number of cataract patients, a few days after the operation, general symptoms suggesting gastric disturbance, such as furred tongue, sour breath and

anorexia. This state is usually accompanied by ocular symptoms: congestion of the conjunctiva, contraction of the pupil and a tendency to the formation of synechiæ. The patients affected in this way were all decidedly arthritic.

The condition did not yield to rational treatment, but the symptoms disappeared in a few hours, when the patients were allowed to get up. He thinks, therefore, that there must be another factor than digestive troubles to account for this autointoxication. The patients who presented these symptoms most decidedly were those who, from fear of making any movement, subjected themselves to an exaggerated immobility, and they were usually pronounced arthritic subjects, who have special need of exercise and in whom absolute rest favors the production of toxins.

Experience has shown that it is unnecessary to impose upon a cataract patient a vigorous and prolonged repose, and the author allows his patients to get up in twenty-four or forty-eight hours, and uncovers the other eye the day after the operation.

G. C. H.

THE PATHOLOGIC CHEMISTRY OF CATARACT.—DOR (*Annales d'Oculistique*, April, 1907). This is an extract from the French Encyclopedia of Ophthalmology now in press. The author claims that the initial process of cataract is a hydration of the lens, and not a dehydration, as is usually maintained.

It is generally admitted that the normal lens contains globulin and albumin. Simon demonstrated, in 1842, that it contains several kinds of albumin, and more recent observers have confirmed this view, but the idea that there may be in the lens a particular substance different from globulin and serin and deserving the name of crystallin is modern and was first demonstrated in the publications of Moerner. He showed that the lens contains a substance, insoluble in water or in salt solution, in a proportion of 48 per cent. unequally distributed—21 per cent. in the cortical layers and 64 per cent. in the nucleus. This insoluble substance, which he calls an albuminoid, in calcination, gives an odor of sulphur. It is soluble in mineral acids and precipitates by neutralization. Its temperature of coagulation is from 45° C. to 50° C.

It is contained in considerable proportion in the lens and has chemical characters that distinguish it from all other albuminoid substances. Moerner calls it the albuminoid of the lens. In addition to this insoluble substance, there exists in the lens two soluble substances which are neither globulin nor albumin and which Moerner calls *a* crystallin and *b* crystallin. These two substances are

precipitated by sulphate of magnesia like globulin. By saturation with salt they remain transparent, like vitellin, and are distinguished from globulin by the fact that distilled water never precipitates them. They are distinguished from each other by one being precipitated by acetic acid and being poor in sulphur, while the other is not precipitated by acetic acid and is rich in sulphur. One is formed in the external layers and the other in the central. These substances are modifications of each other. The albumin of serum, which is found in small quantity in the lens, is transformed first into a crystallin under the influence of diastatic substances contained in the nuclei of the external fibers. In the deeper fibers the *a* crystallin is transformed into *b* crystallin. These two substances are in a semifluid state and adapt themselves readily to the changes of curvatures in accommodation. But the natural evolution of these two crystallins is transformation into the insoluble substance which is deprived of elasticity, and the more the lens contains of it the more it loses its power of accommodation.

The lens is normally modified in increasing age. While that of young people can be separated into a series of stratified layers, like the layers of an onion, until it is reduced to an extremely small volume, the senile lens has a hard nucleus which it is difficult to separate from the superimposed layers. This nucleus has a yellowish amber color, while the center of a young lens is clear. The form of the senile lens is also altered. As its refracting power increases it becomes less convex. In some cases the form is not altered and the subject becomes myopic. This is particularly the case in the commencement of diabetic cataract. In other cases the lens becomes flat, while its index of refraction does not increase proportionately and senile hypermetropia results. While the nucleus becomes yellowish and of a dense consistence, the cortical layers undergo a similar change, becoming harder and less transparent. This process consists essentially in a dehydration and chemical analysis shows that the senile lens contains less water than the youthful one. It contains, on the other hand, a greater quantity of calcareous salts, as it is a general law of the organism that as organs grow older they lose in soda and gain in chalk. According to Deutschmann, the lens at 3 years of age contains 70 per cent. of water and at 63 years 64.6 per cent. The fact of the dehydration of the senile lens is well established. It seems probable that the evolution (involution?) of senility consists in the transformation of soluble crystallin into insoluble albuminoid, and

than, at the same time, there is a partial liberation of tyrosin, which substance, when set at liberty, tends to oxydize and become dark in color.

The evolution of cataract in a young lens is not absolutely the same as in an old one, and, from this point of view, it is rational to speak of a senile cataract, but senility does not spontaneously end in any other form of cataract than the black, and other forms of senile cataract are simply diathesic cataract occurring in old subjects.

The idea that cataract consists of a dehydration of the lens is an absolute error. Deutschmann has shown that, while the lens is dehydrated in becoming senile, this does not occur in cataract. A cataractous lens contains more water than a normal lens at the same age.

In soft cataract a slight modification only of the index of refraction has been noted, but in senile cataract a considerable increase of density is found, and there is a decided difference in the density of the cortical and the central layers. In cortical senile cataracts the nucleus becomes more dense, but the density of the cortical layers is diminished. The cortical layers have an increase of water, and the albumin disappears. The author's researches have shown that in cataractous lenses there is sometimes very little soluble albumin and sometimes none. Chemical analysis of cataractous lenses shows that the density diminishes in the cortical layers and the special albumin that fills the fibers disappears after a period in which this substance is hydrated. This, the author claims, has been scientifically demonstrated and does not admit of doubt. Cataract, therefore, is not a dehydration, but, on the contrary, a hydration of the lens.

G. C. H.

CASUISTICS.

TO THE CASUISTICS OF COLOBOMA OF THE EYE.—NOLL, H. (From the eye clinic of Prof. C. Hess in the University of Würzburg. *Archiv. fuer Augenheilkunde*, lviii, p. 280). A girl, aged 2½ years, showed on both eyes dermoids at the limbus, colobomata of iris, chorioid on left upper lid, and an oblique congenital fissure on each cheek. The dermoids on the right eye consisted of a round, whitish-gray tumor at the nasal limbus, of tough consistency, sharp borders, larger than a lens. It encroached upon the cornea as far as the pupillary area and had the same dimensions on the conjunctiva. A similar tumor, but smaller, was situated at the lower limbus. It was very hard, consisted of epidermis, stroma of connective tissue with sudoriferous glands and hair follicles.

C. Z.

FURTHER CUSCUTICS TO THE REMOVAL OF PIECES OF IRON FROM THE EYE WITH THE INTERIOR POLE MAGNET.—AMBERG, HANS (From the eye clinic of Prof. C. Mellinger, in the University of Basel. *Zeitschrift fuer Augenheilkunde*, xviii, December, 1907, p. 511), reports the clinical histories of 16 cases, treated with the interior pole magnet, described by F. Jurnitschek (*Zeitschrift fuer Augenheilkunde*, xiv) and reviewed in OPHTHALMOLOGY. Seat, volume and weight of the extracted pieces are arranged in tabular form. The maximal intensity of the current was 8 ampere with 110 volt, the minimal 4 ampere with 220 volt. With regard to the technic, Amberg refers to the article by Jurnitschek. Generally the piece of iron, when drawn into the anterior chamber, can be extracted without difficulty, but for the last act of extraction the hand magnet of Hirschberg is often very useful.

For the absorption of exudations, subconjunctival injections of salt solutions, eventually with inunctions of mercurial ointment and iodid of potassium, were employed, which in some cases saved the eyes, in spite of advanced infection.

In 34 out of 36 cases the extraction with the interior pole magnet was successful. It did not succeed in a case of a foreign body impacted in the ciliary body and in a case of retrobulbar seat.

The depth to which a foreign body enters the eyeball is proportional to its weight, according to the physical law, viz.: that the actual energy at a given velocity is proportional to the mass. The hydrodynamic pressure within the eye does not cause such lacerations, as, e. g., projectiles from rifles in the brain or the filled bladder, as the small pieces of iron have less velocity and produce only slight water displacement.

The interior pole magnet is also useful for extraction of pieces of iron from the nose and ear as reported by Koellreutter.

C. Z.

SEVENTEENTH REPORT OF THE EYE DEPARTMENT OF THE COUNTY HOSPITAL AT LAIBACH, KRAIN, FOR 1907.—BOCK, EMIL, Primarius. Fourteen hundred and fifty-three new patients were admitted. Out of 555 operations, 117 were for cataract, viz.: 65 flap extractions, 50 with, 15 without iridectomy, 20 with lance-shaped knife, 22 discissions, 10 discissions of secondary cataract, 98 iridectomies, of which 27 were optical, 43 for occlusion of pupil, 16 for increased tension, 12 preparatory, 21 operations for prolapse of iris, 78 galvano-cauterizations for suppurations of the cornea, 2 extirpations of the tear sac. Fifty-one operations were performed in narcosis, viz.: 37 with ether-chloroform, 14 with

ether. The comparative results were good. One patient, operated on for cataract, destroyed his eye by rubbing it with his fingers on the sixth day. C. Z.

REPORT AND COMMENTS OF THE EYEBALL INJURIES BY IRON FOREIGN BODIES AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE, NEW YORK CITY. KNAPP, HERMAN and STOLL, LOUIS, New York (*Arch. Ophthalm.*, November, 1907, xxxvi, 181). The authors have previously reported two series of cases of penetrating injuries of the eye (*Arch. Ophthalm.*, xxxvi, 1, and *Arch. Ophthalm.*, xxxvi, 485), and now add an additional series of 14 cases. These are grouped as follows: 1. Foreign body surely in the interior but not localized by the magnet. Enucleation brought evidence. 2. Foreign bodies are evidenced by magnet; extraction failed; they are shown after enucleation. 3. Iron foreign bodies suspected in the eye, but examination with the magnet was negative. Recovery under expectant treatment. Such cases ought to be examined under the x-ray.

A summary of the 66 reported cases shows that "the foreign body was extracted in 51 cases; of which afterward the eye was enucleated 4 times and preserved 47 times. . . . Enucleation had to be performed in 12 cases, or in 18 per cent. Four times the foreign body had been extracted successfully, but it had been infected and panophthalmitis ruined the eyes. Eight times the foreign body was found after enucleation. It had not caused any reaction of the magnet 6 times; in one case it had been seen with the ophthalmoscope, in one case the magnet indicated the steel, but failed to extract it. In 11 more cases the magnet was applied unsuccessfully, but the patients were discharged with the eye free from irritation and several had even good sight." W. R. M.

CIRCULATION.

THE CENTRAL RETINAL VEIN IN PAPILLARY STASIS ("CHOKED DISC").—DUPUY, DUTEMPS (*Archives d'Ophthalmologie*, November, 1907). Papillary edema, whatever may be the etiologic conditions, is the result of venous stasis, and, therefore, has a mechanical and not an inflammatory origin. This papillary stasis is produced by compression of the vein at a point where it traverses the sheath of the nerve. This compression is caused, in the case of cerebral tumors and other intracranial affections, by distension of the sheath of the optic nerve with cerebrospinal fluid forced into it under pressure. Papillary stasis is in these cases a symptom of intracranial hypertension.

In the case of orbital tumors, papillary stasis occurs when the tumor acts upon the anterior part of the nerve and compresses the central vein. It is not found when the tumor is situated further back and the central vessels escape compression.

The condition of venous congestion is shown, in the ophthalmoscopic examination, by the tortuosity and dilatation of the veins and retinal hemorrhages. Turck and Graefe admitted that venous stasis was the first phenomenon in the evolution of the lesion and that the edema and sclerosis were merely its consequences. To explain the stasis, which was manifest only in the papilla, Graefe supposed that the scleral ring traversed by the optic nerve acted the part of a "multiplicator," enclosing, like a band, the already swollen extremity of the optic nerve and its contained vessels to augment the venous stasis and edema and contribute also to the contraction of the arteries.

It is now definitely demonstrated that compression in the cavernous sinus has no part in the production of papillary stasis, but the idea of the "multiplicator" of Graefe and the strangling of the papilla is still maintained.

Recent pathogenic theories maintain that edema of the nerve, either from serous imbibition or lymphatic stasis, is the primitive condition and that the venous stasis is due to the compression that edema exercises upon the central vein, particularly in the region of the inextensible scleral ring.

The author has exhibited to the French Ophthalmological Society preparations of four optic nerves from subjects of cerebral tumor which showed an absence of any pressure of the vessels at the scleral ring, and claims that they demonstrate the incorrectness of the theory of Graefe.

Deyl has shown that in papillary stasis the central vein is compressed at the point where it penetrates the dural sheath, following a direction more or less oblique and forming an elbow, and the author claims that his observations confirm this fact. As the result of a study of five cases of choked disc in cerebral tumor he concludes that: 1. The central artery and vein are not contracted in any part of their intraneural passage. 2. The central vein is already flattened in its passage through the pial sheath. 3. In the intravaginal cavity the flattening of the vein is at its maximum, its caliber being reduced to a simple slit. 4. In the internal part of the dural wall the vein remains strongly compressed and may even, with a feeble enlargement, be confounded with a connective tissue interspace, but at its passage from the dural wall it suddenly expands. 5. The artery in its passage through the sheath does not

present any notable change. It is sometimes normal and sometimes slightly puckered.

G. C. H.

EMBOLISM OF THE CENTRAL RETINAL ARTERY TREATED WITH MASSAGE.—CASPAR, L., Mühlheim am Rhein (*Centralblatt fuer praktische Augenheilkunde*, October, 1907, p. 289). A woman, aged 51, came to Caspar with the statement that, an hour before, without any premonitory symptoms, she suddenly lost the sight of her left eye. The pupil did not react, the optic disc was pale with indistinct borders, retinal arteries filiform, veins narrow. After cocaineization, circular forcible massage was performed for two minutes three times, without producing a change.

The next morning the patient could see on that eye fingers at one-half foot upward, and motion of hand in all directions, except downward and outward. The optic disc was white, opaque, the superior nasal artery at the disc and a little farther was empty and after its bifurcation filiform. The other arteries and veins contained more blood than the night before. The retina at the posterior pole was opaque, and a red spot was visible at the macula. Massage. In the afternoon V. = 1/50 excentrically upward. The superior nasal artery was partially filled with blood, but empty at the disc. In the corresponding vein innumerable red granules moved uninterruptedly with great rapidity in a centripetal direction. Massage was applied twice a day.

On the third day V. = 1/v. A large wedge-shaped defect of the visual field extended from the point of fixation downward and outward to the periphery. The opacity of the retina and the redness at the macula were subsiding, and the circulatory phenomena had ceased.

The next day the superior nasal artery, still attenuated, was uniformly filled with blood. In its portion on the disc three white round dots filled its lumen. Centrally from these, the two macular arteries arose from the superior nasal artery, and a slight milky haziness of the retina covered the area supplied by them. A similar wedge-shaped opacity marked the field supplied by the superior nasal artery.

On the seventh day the retina was almost normal and no opacity noticeable at the macular region. Four weeks after the accident V. = 2/v. Massage was discontinued, iodid of potassium was given, and after a month V. = 3.5/v, with a defect of the visual field corresponding to the area supplied by the superior nasal artery and a central scotoma for colors.

Caspar had the impression of an improvement after each treat-

ment so that the favorable course of the affection was not entirely due to the early and long-continued massage. C. Z.

ON THE ANATOMO-PATHOLOGIC CHANGES OF THE BLOOD VESSELS OF THE EYEBALL IN SYPHILIS.—VON MICHEL, J., Berlin (*Zeitschrift fuer Augenheilkunde*, 1907, viii, p. 295). The blind left eye of a man, aged 38, with normal right eye, presented very much increased tension with opacities of the cornea and vitreous preventing an ophthalmoscopic view. On account of a possible intraocular tumor the eye was enucleated.

The microscopic examination revealed syphilis as the cause of the disease. No other syphilitic symptoms could be found. The limbus corneæ and the sclera around the transit of the blood vessels were the seat of small-celled infiltration, the vessels themselves being intact. The chorioid and the optic disc were pervaded by innumerable leucocytes, and the layer of nerve fibers in the retina by small cells. In connection with the anterior surface of the optic disc an extensive infiltration of the vitreous with round cells was found, and the meninges of the optic nerve were not free from small-celled infiltration (leptomeningitis syphilitica). Of the vessels, only those of the iris and the central artery and vein were affected, i. e., almost exclusively the adventitia and intima, scarcely the media. According to von Michel, anatomic-pathologic experiences, supported by others, as shown by numerous quotations from literature, this seems to be the characteristic of syphilitic affections of the walls of the ocular blood vessels. Four colored drawings illustrate the interesting histologic condition. C. Z.

REMARKS UPON TRAUMATIC SUBCHORIOIDAL AND EXPULSION HEMORRHAGES.—TERSON, M. A. (*Archives d'Ophthalmologie*, July, 1907). These two clinical types of intraocular hemorrhages, one the result of chance traumatism and the other of operation, have a different etiology and pathogeny. In the former type the hemorrhage is secondary and passive—hemorrhage with expulsion of the contents of the ball, not expulsive hemorrhage; the hemorrhage merely accompanies the expulsion, does not cause it, and the eye is collapsed. In the form that sometimes occurs after cataract extraction the eye remains round and full, the chorioid is separated from the sclerotic and bulged forward and the retina is totally detached or even forced into the wound. The two forms are illustrated by plates from sections of enucleated eyes.

The expulsive form may follow any opening of the ball, such as corneal sloughing, cataract extraction, iridectomy, abscission or the Saemisch incision. Cases are recorded in which it caused bursting

of the globe in absolute glaucoma. The subjects of these expulsive hemorrhages are predisposed either locally or generally or both. Local vascular lesions, sclerosis of the intraocular membranes and sudden diminution of pressure favor its occurrence in old glaucoma. In non-glaucomatous eyes sclerosis of the chorioid and of the vessels may be the cause in connection with traumatic or operative diminution of tension. Nearly always in glaucoma arteriosclerosis is present and is associated with general arterial hypertension, an important factor in vascular rupture. In secondary glaucoma, the sclerosis of vessels resulting from long-continued pressure suffices to explain the hemorrhage. Sometimes emotion, straining, and other occasional causes have a rôle in provoking it and may act in cases of spontaneous rupture of the globe in absolute glaucoma. Several observers have found the vessels diseased in cases of expulsive hemorrhages.

The general arterial hypertension in subjects of arteriosclerosis is an important factor in expulsion hemorrhage and is common in glaucomatous subjects.

Frankel found arterial hypertension in only 9 per cent. of cataract patients and concluded that, as arterial hypertension and arteriosclerosis are usually associated, cataract can not be due to arteriosclerosis. Researches of the author confirm Frankel's conclusions. He thinks, however, that it is more important to look for increased arterial tension than for sugar or albumin in the urine before operating for cataract, and that, if it is found, the operation should be postponed until the tension has been diminished by dietary, hygienic and medical measures, particularly if there has been expulsive hemorrhages in a previous extraction on the other eye. He thinks that, in such cases, it is much better to extract after medical treatment and preliminary iridectomy than to depress the lens.

G. C. H.

CONJUNCTIVA.

CONCERNING HYALIN AND AMYLOID DEGENERATION OF THE CONJUNCTIVA. SCHIECK, Göttingen (*Graefe's Arch.*, lxxvi, II, 1, November, 1907). The primary growth occurred when the man was 19 years of age. The tumor was situated at the inner angle of the eye, springing from the caruncle. The entire conjunctiva, from the caruncle to the cornea, was involved. It spread out the fornix below and seemed to have caused adhesions of the fornix above. It was red-yellow with a peculiar transparent granular surface with beginning ulcerations. The growth bled readily and was freely movable over the sclerotic. Its most prominent eleva-

tion was about 1 cm. Six months after its complete removal the patient returned with a mass which involved all but the temporal part of the conjunctiva. The surface had a yellow-red hyalin appearance. It was quite vascular, the vessels springing from the conjunctiva. The bulbar conjunctiva in its lower half was edematous, but not diseased. The growth was extirpated. An exhaustive study of the pathology of the affection was made. The author concludes that both tumors, clinically and anatomically, were of the same nature, with the exception that in one case the locally preformed sulphate of chondroitin formed a demonstrable chemical union with the hyalin material, hyaline degeneration, whereas in the other case, for some unknown cause, this union did not take place.

In this case a locally formed amyloid body was recognized which exhibited all of the characteristics of amyloid matter, but nevertheless reacted to Best's glycogen stain reaction. W. Z.

A CASE OF STAPHYLOCOCCUS ABSCESS OF THE CONJUNCTIVA.—PASCHEFF, Sofia (*Graefe's Arch.*, lxvii, H. G., November, 1907). The author states that abscess of the conjunctiva may arise from the following conditions: 1. It may be quite superficial and limited to the bulbar conjunctiva, arising idiopathically or through the entrance of a cilium beneath the conjunctiva. 2. As the result of an ulcerative scleratitis. 3. As a consequence of tenonitis. 4. Metastatically after iridochorioiditis.

Pascheff's case occurred in a 22-year-old farmer, who shortly before the formation of the abscess had had furunculosis of the neck and body. The lid was pushed forward. The inward movement of the globe was limited. The eyeball was directed outward and forward. The conjunctiva was congested and there was a mound of swelling between the margin of the cornea and the insertion of the internal rectus. The abscess was evacuated. Beneath the conjunctiva granulation tissue overspread the sclera for some distance. Examination of an excised piece of conjunctiva showed the presence of mast cells and especially eosinophiles. Cultures showed the *Staphylococcus pyogenes aureus*. W. Z.

PATHOLOGY AND THERAPY OF SIMPLE CHRONIC CONJUNCTIVITIS.—SÄTTLER, H., Leipzig (*Klinische Monatshefte für Augenheilkunde*, xlv, ii, 1907, p. 481). In this report, read before the ophthalmologic section of the Congress of German Naturalists at Dresden, Sattler first speaks on the histologic changes in chronic conjunctivitis, viz.: hyperplasia of the adenoid tissue, the more pronounced papillary exuberances, chiefly the alterations of the

epithelium, as the formation of numerous cup cells with their mucinous contents, partially burst open, and polynuclear leucocytes between the epithelium.

Under etiology, the diplococcus of Morax-Axenfeld, toxins, as indicated by various forms of metastatic ophthalmia, pustulous desquamating eczema, sycosis, seborrhea sicca of the lid border, blennorrhea of the lacrimal sac, mechanical and chemical causes, as staying in ill-ventilated rooms, being exposed to great heat and other noxæ connected with some trades, are enumerated. The great inflammatory influence of the short-waved rays of light on the conjunctiva (as well as the cutis) is illustrated by the occurrence of snow blindness, ophthalmia electrica and, according to Kreibich, Dimmer and Scheck, spring catarrh.

Nitrate of silver is not beneficial in the chronic forms. Sattler prefers protargol in 3 to 5 per cent. solutions, sulphate of zinc in weak solutions. One-quarter of 1 per cent. cocain, or, better, 1 per cent. alypin, may be added to the astringent colligia, or in relatively severe hyperemia 5 drops of suprareninum boricum (Merck, 1:1000). Copper, acetate of lead, and the antiseptics, as sublimate, sublatin, oxycyanate of mercury, are not recommended for chronic conjunctivitis. In harmless concentrations they are not bactericidal, and in stronger solutions they act as protoplasma poisons, detrimentally on the conjunctiva.

In concordance with the findings of bactericidal substances in the conjunctival secretions by zur Nedden, clinical experience has shown that in the treatment of chronic, moderately secreting conjunctivitis astringents deserve preference over antiseptics.

C. Z.

THE PATHOLOGY AND THERAPY OF SIMPLE CHRONIC CONJUNCTIVITIS.—PETERS, ALBERT, Rostock (*Zeitschrift fuer Augenheilkunde*, 1907, xviii, p. 415), emphasizes the great practical importance not only of bacteriologic, but also of morphologic examinations of the conjunctival secretions, as to diagnosis and treatment. The presence, e. g., of eosinophile granula in leucocytes and epithelia is considered decisive for spring catarrh at its very beginning. Peters' attitude as to the formations observed and brought in connection with the etiology of trachoma by Greefe is still unsettled, as his investigations with regard to them in true trachoma were so far not successful.

The etiology of chronic conjunctivitis is discussed under causes acting directly from without, as bacteria or other noxæ, lesions and

irritations of the conjunctiva from the neighborhood, and finally from the blood.

Under the second group Peters mentions an abnormal softness of the skin of the lids with formation of small folds and flaccidities due to chronic dermatitis. The treatment of this with tar preparations has a beneficial effect on the conjunctivitis. In cases of too tightly stretched lids or dry condition of the mucous membrane massage with an ointment of oxid of zinc and ichthyol gives great relief.

The therapeutic failures of suprarenal preparations and of the substitutes of nitrate of silver, e. g., protargol, is explained by their lacking of the properties of caustics, viz.: to promote absorption of inflammatory products by hyperemia following their irritating effects.

C. Z.

THE ETIOLOGY OF OPHTHALMIA NEONATORUM.—WHARTON, JOHN, Manchester (*Ophthalmic Review*, November, 1907). The writer investigated 100 cases of this disease, making a bacteriologic examination of the eye discharge, investigating the mother's history during pregnancy, the condition of the maternal passages after confinement, and any other factors which would throw light on the source of infection. He discusses primary and secondary infection and then takes up the subject of the infective agent: the gonococcus was the cause of the greatest number of cases being present in 75 per cent.; the pneumococcus in 5 per cent.; the *Staphylococcus pyogenes aureus* in 3 per cent.; Koch-Weeks bacillus in 1 per cent., and a negative result in 16 per cent. The gonococcus set up a purulent conjunctivitis, but occasionally a catarrhal form; the pneumococcal inflammations were usually accompanied by coryza and lacrimal obstruction. Purulent ophthalmia was practically always a primary infection; catarrhal inflammations were generally the result of secondary infections, rarely gonococcal, usually produced by one of the other organisms.

The disease was most often seen among the first and second born children, it became manifest usually on the second or third day, both eyes were inflamed in 62 per cent. of the cases, and the type of inflammation was purulent in 86 per cent. and catarrhal in 14 per cent. Only 9 per cent. of the mothers of infants suffering from gonorrheal ophthalmia had normal generative organs, the others all suffered from some pelvic mischief: 56.8 per cent. of the mothers had a vaginitis, the discharge of which contained gonococci. "The absence of a vaginal discharge, a leucorrhea, does not necessarily indicate the absence of gonorrhea. A gonorrheal con-

conjunctivitis may appear in the offspring of a mother who 'thinks' she is quite healthy. The mother's history, certainly among the poorer classes, must not be relied upon, and a rigid prophylaxis should be observed in every confinement." C. H. M.

PURULENT CONJUNCTIVITIS IN INFANTS AND ADULTS.—STEVENSON, MARK D., Akron (*The Lancet-Clinic*, Nov. 30, 1907), describes and emphasizes prophylactic measures that should always be used, and insists on a careful microscopic examination of any purulent discharge. The cause and pathology of the disease in infants and adults is described. If one eye is uninfected, a properly applied shield of mica is used instead of Buller's watch glass. He describes minutely how each step in the treatment should be carried out, and insists that the attendants should be instructed in every detail. The cleansing is done by pressing the solution from small pledgets of cotton so that a swift stream will not be thrown against the cornea. After each cleansing the margin of one of the lids is smeared with sterile vaselin or other ointment to prevent gumming together of the lids and permit free escape of the discharge. Weak silver nitrate solutions are preferred to any of the new silver substitutes. When the lids are greatly swollen, the external canthus may be cut to relieve the pressure on the eyeball, thus reducing the congestion and bettering the nutrition of the eye. The conjunctiva, when it overlaps the cornea, retaining pus in the trough formed, should have openings made in it. As ordinary pus germs are usually present in the discharge from an infant's eyes, the mother's breasts are likely to become infected, unless the child's face and mouth are carefully cleansed before each nursing, and pads of absorbent cotton fastened by a bandage over the infant's eyes while nursing. Artificial feeding is often advisable for the short time during which the discharge continues. M. D. S.

THE PROFUSE IRRIGATIONS ACCORDING TO KALT IN BLENNORRHEA OF ADULTS.—DAVIDS, H. (From the eye clinic of Prof. A. von Hippel in the University of Goettingen. *Klinische Monatsblätter fuer Augenheilkunde*, xlv, August-September, 1907, p. 187). After a review of the opinions of various authors with regard to Kalt's irrigations, Davids reports that, from 1898 on, they were used in the clinic at Goettingen only in cases in which gonococci were ascertained. In blennorrhœa neonatorum the irrigations were soon abandoned, since in some cases the cornea had become more opaque and ulcers had grown larger, while the conjunctival affection subsided promptly.

Kalt's observations were fully verified in hemorrhoids of adults. In 15 eyes of 12 patients very good results were obtained. The concentration of the solution of hypermanganate of potash, devised by Kalt, was reduced to 1-15000, and his tip was replaced by a blunt nozzle of glass. In all cases the suppuration markedly abated within one to two weeks. In none of the cases the cornea was damaged, opacities, infiltrations and ulcers subsided rapidly. No eye was lost, which at admission had given any prospects of preservation.

Dauids thus summarizes his experiences: 1. Kalt's irrigations may at once be employed in every case. 2. They are not painful, but relieve the patient. 3. The most profuse suppuration decreases from the second day. 4. The cornea is not damaged, corneal affections are favorably influenced. 5. Eyes, which formerly would have been completely lost, can be saved by Kalt's irrigations.

C. Z.

TWO CASES OF RECURRENT CONJUNCTIVITIS PRODUCED IN ONE BY THE HORSE AND IN THE OTHER BY THE CAT.—RISLEY, S. D., Philadelphia (*Annals of Ophthal.*, July, 1907). Symptoms produced by coming in close contact with these animals were lachrymation, ocular hyperemia, sneezing and nasal occlusion, which persisted for several hours.

M. B.

CLINICAL OBSERVATIONS ON SPRING CATARRH.—HERBERT, H., Bombay (*The British Med. Jour.*, Nov. 2, 1907). This is an analysis of 39 cases seen in Bombay in the course of about two and a half years. Only 7 of the patients were females. Cases were seen in adults up to 40 years. The cases at the more advanced ages were mild and not very characteristic, and some of them gave only short histories.

"The accepted basis of diagnosis needs widening. Many palpebral cases are liable to be mistaken for trachoma or chronic simple conjunctivitis. The tarsal conjunctiva may present only injection, fine papillary roughness, slight thickening and loss of transparency, with or without small, scattered, pale, follicle-like elevations. A complaint of itchiness, or in young children of constant rubbing of the lids, is, as is well recognized, strongly suggestive. Another very useful indication in these cases is the complete absence of follicles, or the presence of only very few minute normal follicles, in the lower fornix. In trachoma I believe it is true that the fornix is practically never thus free from involvement. At least the distinction has proved a very serviceable one. In trachoma, if there are no follicles and no lymphoid ridge in the lower fornix,

there is some degree of retraction or lines of scar tissue to be seen.

"There is usually in spring catarrh no discharge to be seen, but if the upper lid be held everted for a minute and then released, this exposure is sufficient to produce in ten minutes or so a scanty, thin, filmy exudate on the tarsal conjunctiva. A similar membranous film may be produced by exposure in cases of acute conjunctivitis, but not, I believe, in cases of conjunctivitis at all likely to be mistaken for spring catarrh. In the least irritative forms and phases of spring catarrh, however, repeated exposures may be needed for a very scanty formation of exudate. It forms most rapidly and freely in the more obviously active and irritative cases—not necessarily cases with large vegetations. The diagnosis may be clinched by examining the membranous discharge for eosinophiles. These cells are found unevenly distributed, but in enormous numbers. I believe that this finding is quite conclusive in the cases where the diagnosis of spring catarrh is in question. It is important to take freshly-formed exudation, because the eosinophile cells break up rapidly, and the free granules are generally not stained by Leishman's or other similar stains. They may, however, be well seen if the specimen be simply stained with eosin and then very lightly counter-stained with weak methylene blue. In computing the proportion of eosinophiles, epithelial cells should be ignored. It is the proportion to the total wandering cells that is so striking. And one must not mistake the nuclei of broken-up eosinophiles for lymphocytes."

The palpebral exudate can be obtained quite readily in the ocular type of the disease; the tarsal conjunctiva is practically never of quite normal smoothness in ocular spring catarrh; there is always some slight papillary roughness covering the upper portion of the upper tarsus and this may serve in the diagnosis of doubtful limbus swelling.

Fluorescein-staining points, mentioned by the writer four years ago, were numerous and characteristic in some limbus thickenings. They were not always confined to the definitely thickened portions of limbus. It appears always worth while to instil fluorescein in cases of doubtful limbus swellings. Occasionally, instead of the more usual bright greenish-yellow superficial spots, minute, buried, buff-colored points were seen after the use of the stain. The stain had colored the contents of minute epithelial vesicles. These vesicles are commonly less visible unstained, as whitish points, and are so minute as to necessitate the use of the corneal loupe for their enumeration.

Blood counts were made in 22 of the cases. Only the proportion

of eosinophiles to total leucocytes was noted. Eosinophilia was slight or moderate in degree. The percentage varied from 35 to 174. In three patients re-examined after considerable intervals there was variation in the eosinophilia corresponding with changes in the condition of the conjunctiva. But in comparing different cases there was no general correspondence between the abnormality of the blood and the degree of conjunctival proliferation.

Regarding treatment, a trial was given to salol, a saturated solution in almond oil, instilled six times a day. It was commonly used in one eye and adrenalin in the fellow eye. The results were not uniform. Sometimes one eye improved the faster, and sometimes the other, and in other cases neither medicament did any good.

C. H. M.

CONTRIBUTION TO THE STUDY OF PERIODIC VEGETATING CONJUNCTIVITIS (SPRING CATARRH). ANTONELLI, A. (*Archives d'Ophthalmologie*, July, 1907). Antonelli reports the case of a farmer, 32 years of age, who had suffered from periodic conjunctivitis since he was 3 years old. The milky aspect of the conjunctiva was typical, and there were some small vegetations near the free borders of the lids. The limbal vegetations were enormous, attaining, in the upper nasal region, the size of a small raspberry. The cornea was extensively involved, the pupillary area being surrounded by an opacity more and more dense toward the limbus. Vision was about three-tenths in each eye. Limbar vegetations had been removed from the temporal side of the left eye by excision several years before, and there was a vascularized cicatrix in this position. The mass on the nasal side of this eye, which prevented perfect closure of the lids, and smaller vegetations on the right eye were excised by the author and the galvanocautery was applied. The patient was temporarily much relieved and returned to his distant home, but new vegetations subsequently appeared and vision was further diminished.

Microscopic examination showed that the epithelial layer was not much altered, but thickened only in places. The stroma, which formed the mass of the vegetations, was not sclerosed but appeared, in some places, to be rarefied and almost areolar. It presented a small-celled infiltration which constituted a granulomatous focus of leucocytes (pseudo-follicles). There was a considerable number of vessels which were generally found at some distance from the epithelial layer. They did not resemble an angioma; there was simply a highly vascularized connective stroma. There were a number of elastic fibers, a few pigment granules and glycogen. There were

three kinds of cystic cavities which the author considers important. One comprised cysts of vacuolization of epithelial granules resulting from degeneration of the elements. These cysts were quite numerous and corresponded to those described by various authors. The second kind consisted of very small lymphatic cysts. The third consisted of well-formed cavities isolated in the fibrous stroma. The last, by their deep seat, their structure and conformation and their volume, suggested a pre-existing organ rather than a cystic new formation. The author is inclined to think they may be cystic degenerations of the glands of Manz—glandular utricles in the conjunctival limbus described by Manz in animals and by Stromeyer and others in man, but whose existence in the human subject is denied by other authorities. These utricles may be constant in certain animals and very rare or rudimentary in man, and that may account for the rarity of the cystic formations described by the author. He considers the limbar form of periodic vegetating conjunctivitis more common than the tarsal. It commences as periodic limbar conjunctivitis and it is not until later that it can be called vegetating. The diagnosis is sometimes difficult, particularly from the bulbar conjunctivitis of so-called hay fever, which may occur without fever or pronounced nasal or respiratory affection. Some authors have maintained that there is a relation between spring catarrh and hay fever. Axenfeld says that the secretion in cases of spring catarrh closely resembles that in bronchial asthma. The influence of heat and dryness affects periodic conjunctivitis destined to become vegetating as it does the conjunctivitis associated with seasonal rhino-pharyngitis. When periodic conjunctivitis becomes vegetating the periodicity is no longer regularly seasonal, but the alternations of attack and remission are frequent and irregular. The name nasal conjunctivitis, which has been proposed for spring catarrh, is more appropriate for the conjunctivitis accompanying hay fever, or, at least, for that so often associated with chronic hypertrophic rhinitis.

The author thinks that Axenfeld is too optimistic as to the final prognosis of the affection. It is true that, in the end, the conjunctiva may resume its normal aspect, even in cases of extensive limbar proliferation, but it is also true that the affection usually lasts a long while without admitting any positive prognoses of its duration and that the cornea may be involved and extensively altered. The case above reported shows our powerlessness, as radical excision and cauterization did not prevent recurrence.

Notwithstanding the anatomic reasons that have induced some

authors to consider spring catarrh a papillomatous or warty conjunctivitis or an atypical papilloma or even fibroma, the author thinks that the clinical picture of the disease is that of a periodic inflammation which ends in hypertrophy or hyperplasia of the mucous membrane. All the elements of the mucous membrane and submucous tissue are involved in the hypertrophic process in a variable degree—sometimes the connective tissue more than the epithelium and sometimes the epithelium more. The vascularization accompanies all hypertrophic processes; the lymphoid infiltration shows inflammatory attacks, and the presence of glycogen and the hyaloid degeneration with the formation of pseudocysts are not rare in inflammatory new formed tissue.

The pathologic anatomy of trachoma shows a granulomatous process of the mucous membrane and later of the tarsus itself, while that of spring catarrh is a diffuse and chronic inflammatory process ending, we know not why, in a kind of vegetation.

G. C. H.

UNIOCLAR DIPHTHERITIC CONJUNCTIVITIS.—LUEDEL, W. H., St. Louis, Mo. (*The Amer. Jour. of Ophthalmology*, November, 1904). The writer reports two instances of unioclar diphtheritic conjunctivitis, one occurring in his own practice, the other reported by Dr. E. H. Higbee. In both cases the diagnosis was made from the eye before other involvements appeared, the action of antitoxin was very satisfactory, and serious ocular complications were avoided.

He alludes to the confusion which exists in statistics of diphtheritic conjunctivitis; this may depend upon the prevalence or absence of diphtheria of the pharyngeal or laryngeal variety, or may be due to the lack of uniformity in the classification of diseases of the conjunctiva in which there is a formation of membrane. He considers the distinction between "croupous" or superficial, and "diphtheritic" or deep forms, as more or less useless, since there are no real and constant differences between them: one may change into the other, and both may be present at the same time; on this account it is better to place all cases under the one head of "diphtheritic conjunctivitis," as is done by Haab, Morax, Axenfeld, Fuchs and others.

The writer points out that unioclar diphtheria is as a rule quite rare, and yet at times it seems to be the prevailing type. It indicates rather a mild type of the disease.

C. H. M.

THE VALUE OF BACTERIOLOGICAL EXAMINATION IN TREATING CONJUNCTIVITIS.—MCKEE, HANFORD (*The Medical Record*,

Journal, December, 1907). While the vast majority of cases of conjunctivitis are due to bacteria, there is, nevertheless, quite a percentage in which no pathogenic micro-organisms can be found. We divide conjunctivitis, then, into two great classes: 1. Where there is no bacterial cause. 2. Where there is a definite bacteriological factor.

In Class 1 we place those cases due to foreign bodies, smoke, rhinitis, gouty diathesis, errors of refraction, and as yet, trachoma, follicular conjunctivitis and spring catarrh.

In Class 2 we have conjunctivitis due to the gonococcus, streptococcus, pneumococcus, Koch-Weeks bacillus, the diplobacillus of Morax-Axenfeld, the bacillus coli communis, the bacillus diphtheria, bacillus influenza, the micrococcus catarrhalis, the meningococcus, bacillus ozaena, Friedlander's bacillus, bacillus mucosus capsulatus.

In bacteriological examination of nearly 2,400 cases of conjunctivitis made in the clinics of Axenfeld, Gonin, Pollock, Myerhoff, and at the Montreal General Hospital, it was determined that the chief factors in causing conjunctivitis are the Morax-Axenfeld diplobacillus, the pneumococcus, the Koch-Weeks bacillus and the gonococcus. The technic of this bacteriological examination is easy and can be readily pursued in one's office. For routine work the examination of a smear on a glass slide will give satisfactory results.

In Morax-Axenfeld and Koch-Weeks conjunctivitis the smear preparation will give you a positive diagnosis. In pneumococcus, gonococcus, and diphtheritic conjunctivitis, and where negative results are obtained, the inoculation of media is necessary. The pathogenic bacteria of the conjunctival sac are not easy to cultivate, and unless you have special media, at the proper reaction much of your bacteriological examination from cultures will be negative. Of the different forms the most common is the Morax-Axenfeld, which varies in its clinical picture from a mild catarrhal to a severe purulent conjunctivitis, so that diagnosis must depend upon finding the bacteriological cause—the diplo-bacillus of Morax-Axenfeld. It is a chronic form of conjunctivitis and with proper treatment will last at least four weeks. That the diplo-bacillus may be a source of danger has been better recognized of late. In the past year many cases of severe ulceration of the cornea, due to the diplo-bacillus, have been reported.

In Koch-Weeks conjunctivitis we have our most contagious disease and one which increases in severity as it goes from one mem-

ber of a family to another, and it seems to be more persistent in children than in adults.

Pneumococcus conjunctivitis is a form which favors northern climes, appears at the coldest season of the year, and is often associated with coryza. The inflammation may be slight and the disease runs its course in a few days, or it may increase in severity, simulating a blennorrhea. Slight, red nose edema with purulent discharge and intense swelling of the lids give this form of conjunctivitis a clinical picture differentiating it from any other form. A pseudo-membrane may develop. Many cases of purulent ophthalmia and blennorrhea neonatorum attributed to gonococcus infection, he believes, are not due to that micro-organism, but to an organism which can not be distinguished from it except by careful examination, i. e., the micrococcus catarrhalis or the pseudo-gonococcus.

Of the 165 cases of blennorrhea neonatorum examined by Morax only 70 were due to the gonococcus.

When the finding is staphylococcus conjunctivitis we know we have a simple, non-contagious form. Negative findings have here a special value. They tell us to look to other remedial measures, such as refraction, treatment of the nose and throat, and systemic treatment. Koch-Weeks conjunctivitis is treated best by the application of weak solution of silver nitrate and cold compresses. Serious complications in this form are rare. Morax-Axenfeld conjunctivitis is best treated with weak solutions of the sulphate of zinc. The way this agent acts on this infection is a nice feature in ophthalmic therapeutics. In membranous conjunctivitis, where the cause is the bacillus of diphtheria, serum therapy is the first indication. When due to the pneumococcus or the streptococcus, other methods are called for. Where the infection is caused by the gonococcus, treatment must be energetically and carefully carried out. If the streptococcus or pneumococcus be the cause, similar energetic measures are necessary. When the micrococcus catarrhalis is the cause, ordinary methods only are indicated. If the staphylococcus, the bacillus coli communis, the bacillus subtilis, or any other comparatively mild micro-organisms are the factors at work, ordinary irrigation will terminate a short mild course.

F. A. and P. G.

CORNEA.

CORNEAL ULCERS.—FRANTZ, C. P., *BETHESDA (1904) Medical Journal*, Dec. 15, 1907), describes briefly the anatomy and histology of the cornea. The pathologic and reparative processes taking place in different degrees and varieties of corneal ulceration are discussed.

also etiology is considered. He gives particular attention to ulcus serpens, urging the importance of an early diagnosis and the use of antipneumococcus serum in addition to the usual treatment used in the beginning. He recommends for blepharospasm Aert's ointment consisting of 0.5 grams of extract of belladonna to 5 grams of blue ointment rubbed into the temples and forehead twice or three times daily, and for the same symptom in children forcible dipping of the head in cold water for several times a day, holding it there until the child opens his eyes. Moist eczema about the lids is treated by the daily application of 2 per cent. silver nitrate after removal of the crustations. Pilocarpin sweats and the salicylates are useful in almost every type of ulcer. He warns against the use of hydrochlorate of cocain when using strong silver solutions, and says nitrate of cocain should be substituted, as the hydrochlorate with the silver salt forms chlorid of silver, leaving a permanent stain on the cornea.

M. D. S.

VESICULAR AFFECTIONS OF THE CORNEA. — SPICER, W. T. HOLMES, London, Eng. (*Ophthalmic Review*, November, 1907). The writer describes briefly the anatomical peculiarities of the corneal epithelium and alludes to the ease of detachment which predisposes to the development of vesicular affections. In various forms of acute conjunctivitis, in panophthalmitis, in keratomalacia, in neuro-paralytic keratitis, one or more layers of the epithelium are frequently cast off, leaving the parts beneath exposed to injury or infection; and under pressure of a bandage, especially in inflamed eyes, the surface of the cornea may appear uneven, owing to displacement of the epithelium. Another example is shown in the edema produced by cocain, and in the ease with which the whole epithelium is shed after prolonged use of this agent. The protective mechanism of the cornea is considered: (1) through the sensation of pain, and (2) by trophic influence; attention is called to the wide differences in the sensibility of the cornea in different individuals and to the deficient touch reflex which is often found in apparently normal eyes—such examples being most often the seat of vesicular affections of the cornea.

The writer then considers herpes zoster of the fifth nerve, including in this group febrile herpes of the cornea, dendritic ulcers and filamentary keratitis, and advances reasons for considering that there is a nerve basis underlying them and that they are forms of neuropathic ulcers. He describes each of these varieties and then discusses dendritic ulcers and herpes ophthalmicus and relapsing bullous keratitis. Superficial punctate keratitis, which is

considered by some among the herpetic affections of the eye, is regarded by the writer as a form of general catarrh of the conjunctiva and as an infective process rather than a herpes.

Bullæ forming in deep corneal affections, as seen in different forms of interstitial keratitis, keratitis profunda, and in keratitis disciformis, resemble the bullæ in glaucoma, are to be regarded as an edema of the epithelium, and are not considered as coming within the scope of this paper.

C. H. M.

INTERSTITIAL KERATITIS FROM A MODERN STANDPOINT.—STEPHENSON, SYDNEY, London (*Med. Press.*, Dec. 25, 1907). An interesting paper on this subject concludes with the following aphorisms respecting interstitial keratitis: "1. Interstitial keratitis is not a primary affection of the cornea, but is probably in every instance secondary to changes in the anterior part of the uveal tract. 2. The disease is nearly twice as frequent in females as in males. 3. Four-fifths of the cases occur between the ages of 5 and 15 years. 4. The disease can be shown in about two-thirds of all cases to be associated with signs of inherited syphilis, of which the commonest are the dental, facial and ocular stigmata; other important causes of the disease are tuberculosis, acquired syphilis, influenza, malaria and sleeping sickness. 5. Given a predisposing cause, the affection may be excited by almost anything that lowers resistance, local or general. 6. Ulceration of the cornea results in a notable percentage of all cases. 7. The ailment is bilateral in three-fourths of the cases; the interval between the two eyes being attacked may, however, run into several years. 8. Recurrences occur in perhaps one-fifth of the cases, are commoner in cases treated without than with mercury, and are often very difficult to manage. 9. The disease is due to the lodgment and multiplication in the cornea of the treponema pallidum, derived primarily from the uveal tract. 10. Interstitial keratitis does not form more than 1 per cent. of the cases met with in a special department for diseases of the eye."

C. H. M.

A CONTRIBUTION TO THE HISTOPATHOLOGY OF PARENCHYMATOUS DISEASES OF THE CORNEA.—REIS, Bonn (*Graefe's Arch.*, lxvi, H. 2, July, 1907). Reis' contribution consists in the study of two cases. The first was one of bilateral lesion of the cornea. The specimen was secured from an 8-months fetus which had been born living. The internal organs of the child showed syphilitic changes. The mother was syphilitic. The surface of the cornea was full and faintly stippled. In the deep parenchyma there was an annular opacity of an intense gray-white color, less than

color. It was situated near and concentric with the limbus. An exhaustive description of the microscopic findings is given. The *Spirochæta pallida* was not found. The author believes that the condition arose from an ectogenous injury to the cornea during intrauterine life from the presence in the amniotic fluid of a toxin. This he believes to be not only of heretofore unknown origin for parenchymatous disease of the cornea during the fetal period, but that it offers an illustration of how varied may be the manner by which syphilitic virus may harmfully affect a membrane so relatively simple in structure as the cornea. It confirms the opinion expressed by Sidler-Huguenin that congenital syphilis (which has been called spirochætensepticæmia) is as rich in its disease manifestation as is acquired syphilis. The second specimen was obtained from a fetus on which craniotomy had been done because of hydrocephalus. The right eye appeared normal. In the left eye the cornea in its lower half presented a semi-disc-shaped cloudy opacity in the parenchyma separated from the sclera by a narrow clear zone. The portion of the opacity next the sclera was the densest and faded off toward the pupillary margin. Anatomically the opacity was found to be due to inflammatory changes in the parenchyma of the cornea—an interstitial keratitis. The case is of interest as giving anatomical support to the view long held by clinicians, that congenital opacities in the cornea are of syphilitic origin.

W. Z.

A SERIES OF FOUR CASES OF INFANTILE GANGRENE OF THE CORNEA (KERATOMALACIA) IN WHICH THE SPIROCHÆTA PALLIDA WAS FOUND.—STEPHENSON SYDNEY. London (*Ophthalmoscope*, November, 1907). Four cases are reported of keratomalacia in syphilitic infants from the cornea of which scrapings showed the *Spirochæta pallida*, or an organism morphologically not to be distinguished from it. He points out that spirochætes have been found in the tissues by several observers, as the cornea, iris and ciliary body, of seemingly unaffected eyes of syphilitic fetuses and babies. Therefore, there is a question whether the spirochætes would have been found in the cornea of the cases he has reported irrespective of the keratomalacia.

M. B.

ON TWO CASES OF FAMILY DEGENERATION OF THE CORNEA.—BUCHANAN, LESLIE. Glasgow (*Ophthalmoscope*, December, 1907). Two brothers noticed visual failure without inflammatory symptoms at the ages of 19 and 23 respectively. At the ages of 34 and 36 respectively their vision was so poor that they could only see hand movements before the eyes. Their corneæ were alike. Each was

clear for about 1 mm. from the margin, while the central parts were almost completely occupied by little gray spots of opacity, which varied in size from .5 to 1 mm. in diameter, were almost circular and remained discrete. The corneal epithelium was disturbed. An iridectomy was performed on each of the eyes, which improved vision to 20/40. These men were tall and so thin as to be almost emaciated. Two sisters had progressive visual failure with symptoms similar to above. No history nor evidences of syphilis.

M. B.

ON THE ETIOLOGY AND TREATMENT OF FILAMENTOUS KERATITIS.—TERSON (*Ann. d'Oculistique*, June, 1907). The disease consists first of a little raising of the epithelium, of a vesicular appearance, which stretches, becomes pedunculated and twists into a spiral resting on a rather large base adherent to the cornea.

Imperfectly neutralized or altered collyria have been thought to act as a cause, but a number of cases can not be attributed to this cause. The disease is met with not only among aged subjects, in whom various dyscrasias might affect the slender ramifications of the ciliary nerves, but also in young and apparently healthy patients. As to microbean origin, cultures have not given a result that enables us to attribute the lesion to a specific cause.

Treatment with various antiseptics and caustics has not proved satisfactory. The author reports two cases in which free applications of a 1 to 2000 solution of bichlorid was followed by decided improvement in one and complete cure in the other. In cases that prove rebellious to this treatment he suggests repeated subconjunctival injections of sterilized air.

G. C. H.

CALCAREOUS OPACITY OF THE CORNEA AND A METHOD TO MAKE IT TRANSPARENT.—GUILLERY, DR., Cologne. (Abridged translation from the German edition, vol. xlv, by Dr. M. L. Foster. *Arch. Ophthal.*, September, 1907, xxxvi, 675.) The author determined, by a series of experiments, that the primary opacity, caused by the action of lime on the cornea, was due to a deposit of calcium albuminate and that this deposit was soluble in a solution of ammonium chlorid. To determine the tolerance of the human eye to the action of ammonium chlorid he experimented upon himself by instilling a 2, 4 and 6 per cent. solution in his eye. This was followed by no bad result. Quicklime was applied to the cornea of a rabbit resulting in a dense white opacity. The eye was then repeatedly immersed in a solution of ammonium chlorid, resulting in the absorption of the lime deposit and a clearing up of the opacity. This treatment was then tried in a case of severe lime burn

of the eye in a workman. Treatment was begun about three months after the injury. The cornea was opaque over almost its entire extent, partly from true cicatrization and partly from a calcareous deposit. Vision equalled movements of the hand at 50 cm. Treatment was begun with daily baths of the eye in a 2 per cent. solution of ammonium chlorid, which was gradually increased to 20 per cent. At the end of two weeks vision had improved to movements of the hand at 1.5 m. Patient was still under treatment, and the author had not determined what the final result would be. He concludes that "the dissolution of calcium albuminate in the living human eye is possible and that a hitherto inaccessible field has been opened for ophthalmic therapy."

W. R. M.

KERATITIS NEURO-PARALYTICA AND SYMPATHECTOMY. — NOIZEWSKI (*Postępy okulistyczny*, Nos. 4-5, 1907). A married woman, aged 25, consulted the author in 1889 with hemiplegia of the right side. Choked discs were found on both sides on ophthalmoscopic examination. Besides this, the left cornea was found partly clear and partly infiltrated. The next day the right cornea showed the same changes. She soon died. The author remembered an analogous case, occurring in 1886, of encephalitis which shortly after died, in which the corneæ presented similar changes, multiple infiltrations with clear spots of corneal substance between. He calls this a neuroparalytic keratitis for the reason that Bechterew had experimentally produced these same changes in animals. In five cats in which Bechterew had resected 3.5 to 8 cm. of the cervical sympathetic on one side, after a few days the corneæ of the operated sides showed typical keratitis neuro-paralytica.

K. W. M. (TRANS. H. V. W.).

GENERAL DISEASES AND THE EYE.

A NOTE ON CERTAIN PUPILLARY SIGNS IN CHOREA. — LANGMEAD, FREDERICK, London (*The Lancet*, Jan. 18, 1908). The writer says that little attention has hitherto been paid to the changes in the movements of the iris muscles in chorea, most of the text-books merely stating that the pupils are usually dilated or unequal, and that the smaller pupil is usually on the side of the body more affected. Having observed and noted the pupillary phenomena presented by choreic children for some years, he gives the following details: 1. *Hippus*.—In many children who are more than slightly affected by the ordinary sthenic type of chorea the movements of the iris are extraordinarily wide and rapid. 2. *Peculiarities of Movement of Accommodation*.—The contraction of the pupils to accommodation may be extremely rapid and sudden; it will be

frequently seen also that the reaction is synchronous on the two sides, one pupil contracting, while the other remains temporarily dilated. This is especially marked when the pupils are unequal, the larger usually reacting more slowly. 3. *Contraction* of the pupils, both to accommodation and to light, is usually ill-sustained, and here again the affection may be unequal. 4. *Varying Inequality of the Pupils*.—In some cases one pupil remains persistently smaller than the other during the complete examination. 5. *Eccentric pupils* may occasionally be present and may become better marked when the pupil is contracted and less obvious when dilated. In conclusion the writer remarks that these phenomena are by no means uncommon and bear no relation to any particular forms of chorea; the pupil is no more often nor obviously affected on the side on which there is greater movement. "Mere inequality of the pupils is of little significance, for it is commonly found among children, but I have not found the hippus, the altered accommodation or the eccentricity of the pupils in any other general condition except articular or cardiac rheumatism. This is of interest from the point of view of the common etiology of rheumatism and chorea." C. H. M.

PRELIMINARY REPORT ON THE SIGNIFICANCE OF THE OCULAR SIGNS AND SYMPTOMS OF DEMENTIA PRÆCOX AS OBSERVED IN A SERIES OF ONE HUNDRED AND FIFTEEN CONSECUTIVE CASES. TYSON, H. H., and CLARK, L. PIERCE, New York (*Boston Med. and Surg. Jour.*, Jan. 30, 1908). The cases were from private practice, clinics and the metropolitan asylums. Definite changes were invariably found. The fundus changes as seen clinically are divided into three stages, in the order of their occurrence. First stage, congestion of the discs, hyperemia and edema, dilated veins, contracted arteries and blurring of the edges of the discs, of varying degrees, constituting a low-grade perineuritis of the optic nerve. Second stage, congestion of the nasal side with temporal pallor of discs, dilated veins and contracted arteries. Third stage, pallor of discs, dilated veins and contracted arteries, constituting partial or complete atrophy of the optic nerve.

All forms of dementia præcox were under study. The more rapidly deteriorating forms show the most marked changes. The cases embraced both users of alcohol and tobacco, and abstainers. Theoretically, the changes are probably due to a vascular toxin from liver or intestinal auto-infective origin. A vascular alteration with edema takes place, resulting in disturbances of nutrition and slow degeneration of the nerve fibers. Cases in the last stage

have shown fundus improvement under the usual treatment for intestinal auto-infective toxemias.

Other eye symptoms found uniformly were: enlarged pupils, negative sensory reflex, negative psychic reflex, negative Piltz reflex, diminished corneal sensibility, and concentrically contracted visual fields. No other psychosis presents similar conditions. The findings should be found useful in differential diagnosis, to a certain extent in prognosis, and possibly in the study of the pathogenesis and pathology of dementia praecox. C. H. M.

THE CONDITION OF THE INTERIOR OF THE EYE IN MENTAL DISEASES. — BONDI, MAXIMILIAN (*Wiener Medizinische Presse*, Oct. 13, 1907). In 206 cases of disease of the brain the writer found 19 cases (9 per cent.) which showed definite pathologic intraocular changes; in 8 (3.8 per cent.) of these cases the optic nerve was affected; in the other cases the retina, the chorioid and the vitreous were also involved. In 200 normal cases similar pathologic changes were seen in 4.5 per cent. Morbid intraocular changes are not any more frequent in mental diseases than in normal cases.

In conclusion the author states that (1) in some forms of psychoses, as epilepsy, hysteria, melancholia, mania and dementia, the ophthalmoscopic examination was negative; (2) in other forms of psychosis, such as alcoholism and progressive paralysis, where the etiologic factor explains the intraocular pathologic findings, such changes were much more frequent than in normal cases; (3) partly albinotic fundus and *cataracta punctata cerulea* are quite frequent ophthalmoscopic findings in cases of mental disease; (4) no connection could be made out between a high degree of anomaly of refraction, and disease of the mind. G.

THE IMPORTANCE OF OPHTHALMOSCOPIC EXAMINATION IN MENTAL DISEASES.—LUCAS, HUGO and MARKBREITER, IRENE (*Wiener Medizinische Presse*, Nov. 3, 1907). The authors conclude as follows: (1) Ophthalmoscopic examination gives important clues as regards the general state of the degenerative stage of the patient. (2) The ocular symptoms of degeneration are in a certain relation to hereditary sclerosis and other symptoms of degeneration; they are most commonly found in such diseases as paranoia, epilepsy, idiocy and in the functional diseases of the brain, such as alcoholism, hysteria. (3) Changes in the interior of the eye are of frequent occurrence in mental diseases. Hyperemia of the papilla is also quite frequent. J. G.

THE SYNCHRONOUS MOVEMENTS OF THE LOWER EYELIDS WITH THE TONGUE AND LOWER JAW OBSERVED IN CERTAIN DISEASES.

ROBSON, HERBERT J., Leeds, England (*The Lancet*, Dec. 14, 1901).

The writer refers to his previous report of such cases in which slight eversion of the eyelids becomes evident upon protrusion of the tongue or depression of the lower jaw, the lids resuming their normal state when the tongue is retracted or the mouth shut. He believes the main reason why this phenomenon has not hitherto received any attention is that it was not looked for, and that whenever present some severe asthenic condition will be found to exist or it will be found that the patient has been a martyr to pain for many years. The phenomenon almost disappears for a time after the tongue has been protruded several times and also after stroking the forehead or touching the lower eyelids. It is usually present in both eyes. It may disappear as the patients convalesce from various maladies. As regards chronic cases, the patient who presented the phenomenon in the writer's practice was affected with various cardiac and abdominal diseases or headache from uncorrected astigmatism. The phenomenon is never present in health; it comes and goes with the onset and cure of disease, and is, therefore, a clear index or sign of disease.

C. H. M.

EYE SYMPTOMS IN PROGRESSIVE FACIAL HEMIATROPHY.—PAPARCONE, E., Florence (*Annali Di Ottalmologia*, Nos. 3-4, 1901).

Clinical Story.—A female patient, 22 years old, at 6 years of age presented a small depression in the right temporal region. Since that time the disease had progressed slowly. *Present Condition.*—There could be noted an evident asymmetry of the face; the two halves seemed to belong to different individuals, the right half being markedly atrophic, the atrophy ceasing exactly in the middle line of the face. In the right frontal region were two vertical sulci 3 cm. broad and deep. The nose, the throat and the tongue took part in the atrophy. The O. D. appeared smaller and deeper than O. S. With the exophthalmometer of Weiss O. S. projected 6 mm. more than O. D. Taking the point of measurement from the external orbital margin, corresponding to the external palpebral angle, O. D. projected from the level of this margin 7.5 mm., O. S. 13.5 mm. The palpebral aperture of O. D. was 1 mm. narrower and 4 mm. shorter than O. S. From the median line of the nose to the internal angle of O. D. the distance was 17.5 mm., from O. S. 21 mm. T. was normal in O. S.; in O. D. — 2. In the lids the tactile, thermic and pain sensibilities were preserved. The temperature of the two sides was the same. The eyebrows and lashes were

the same color and thickness on the two sides. Lacrimal secretion was increased on the right side. The palpebral conjunctiva was red on both sides, more so on the left; its sensibility was preserved. The corneae were clear and sensibility normal. The right pupil was of the same diameter as the left but reacted lazily. The lens and vitreous showed nothing of note. Vision was about the same in the two eyes. The refraction showed in O. D. a horizontal meridian of plus 3 D. and a vertical of plus 4 D.; in O. S. a horizontal plus 3. and vertical plus 50. V. F. in both eyes for white, blue, red and green were slightly less normal. The ocular movements² were normal. The angle a was 6.5° in O. D. and 6.0° in O. S. With the ophthalmoscope the right fundus showed an irregular papilla, slightly swollen and hyperemic; in the left fundus the point of emergence of the veins was veiled, and this was also the case where they passed from the papilla to the retina. A large vein and an artery in the upper inner part for a short distance seemed almost interrupted. The papilla was of oval form with large diameter transverse, a little contracted at the internal part. The two theories as to the cause of facial hemiatrophy are (a) that it is a disease of the cervical sympathetic, and (b) that it is the result of an alteration of the trigeminus, central or peripheral, as the case may be. In the above case the ocular symptoms would seem to admit of a lesion of the cervical sympathetic. First of all is to be noted the enophthalmos. The experience of most authors is that this symptom is due to a paralysis of the sympathetic. In traumatic enophthalmos most writers attribute the lesion to a trophoneurotic disturbance, due to paralysis of the sympathetic. The enophthalmos is probably caused by a lesion of the sympathetic which produces paralysis of the loose muscle fibers of Tenon's capsule and an atrophy of the retrobulbar cellular tissue. With a lesion of the sympathetic we see the other symptoms, viz.: small palpebral slit, — T., hyperemia of the conjunctiva, increased lacrimation, sluggish pupil reaction, inflammation of papilla, filling of retinal vessels.

R. H. J.

ACUTE IRITIS IN RHEUMATOID ARTHRITIS.—BURT, J. BARNES. Cambridge (*Ophthalmoscope*, January, 1908). The diagnosis of rheumatoid arthritis is fully established. Both gonorrhea and rheumatic fever were excluded. The first onset of iritis occurred within three months of the onset of the rheumatoid arthritis. The iritis resembled rheumatic iritis in its tendency to relapse and the

severe pains produced by it. Skiagrams are presented showing the changes in the bones commonly found in rheumatoid arthritis.

M. B.

THE OCULAR MANIFESTATIONS OF JUVENILE TABES. CANTON: NET (*Archives d'Ophthalmologie*, November, 1907), reports a case of this rare disease and refers to 88 others found in literature. He concludes that juvenile tabes, though a rare affection, is not absolutely exceptional, and that more cases would be found if more attention were given to the subject.

Syphilis is as important a factor as in the tabes of adults. He found a hereditary syphilitic affection in 51.1 per cent. of the cases and an acquired infection in 8.5 per cent.

Sixty-two and six-tenths per cent. of the patients were girls, while, according to Erb, there are 350 tabetic men to 19 tabetic women.

The mean age at the commencement of juvenile tabes is 15 years.

The initial symptom of tabes in the adult, according to the statistics of Kutner, is the appearance of lightning pains in 54 per cent. of the cases, vesical troubles in 9 per cent. and amblyopia in 10 per cent. In children lightning pains open the scene in 25.2 per cent., vesical troubles in 18 per cent. and amblyopia in 14 per cent.

Locomotor ataxia occurred in children in only 32 per cent. of the cases, while in the adult it is met with in 65 per cent. On the other hand, affections of the joints, which occur in only 4 or 5 per cent. of adults, reach 11 per cent. in children. Lightning pains are met with in 65 per cent. of adults and in only 40 per cent. of children. Heinrich has shown the relative frequency of scoliosis.

The pupillary affections of tabes are anisocoria and Argyll Robertson sign. In the adult a complete suppression of the pupillary reflex has been noted in 30 per cent. of cases on both sides and in 13 per cent. on one side. In children it is noted in 11 per cent. on both sides and in 2 per cent. on one side.

Oculomotor paralyses in the adult are estimated at 39 per cent. by Moeli and Berger, and Gowers says that four-fifths of tabetics have them at some period of the disease. In children the author found them in only 18.6 per cent.

In many of the juvenile cases the presence of nystagmus was noted, but always of nystagmus consecutive to complete amaurosis, in no case independent of visual troubles.

Mirailhe and Delaux have reported several cases in which an

modifying the visual axis by placing a tube before one's eye made manifest a latent ocular ataxia. This ataxia existed in the author's case without ataxia of the limbs.

Ocular lesions of hereditary syphilis were represented in the young tabetic seven times by chorioretinitis and five times by parenchymatous keratitis— a total of 13.90 per cent. Optic atrophy was found in 13.9 per cent. Ocular paralyses are much less frequent in tabetic children than in adults.

According to Benedict and Charcot, blindness seems to have a favorable effect upon the progress of tabes; and Marie and others have shown that amaurotic tabes is a special form of the disease. In the 40 cases of juvenile tabes with atrophy the author found 76.5 per cent. of amaurosis without any ataxia, 20 per cent. with slight ataxia, and only 9.5 per cent. with marked ataxia. The prognosis of juvenile tabes, therefore, is very unfavorable as to vision but relatively favorable as to life. Of the 89 patients, 12 were followed from 10 to 20 years and no one of them died.

As with the adult, general paralyses may be added to juvenile tabes.

G. C. H.

SERIOUS SPONTANEOUS CONJUNCTIVAL HEMORRHAGE DUE TO A HEREDITARY DIATHESIS DIFFERENT FROM HEMOPHILIA.—SULZER. (*Annales d'Oculistique*, May, 1907). The patient was a woman 60 years of age. Her mother died at 80 years of age of intestinal hemorrhage after having suffered for three years from frequent spontaneous hemorrhages from the mucous membranes—buccal, nasal, respiratory, urino-genital and intestinal. The twin sister of the patient died at 30 years of age, after three years of hemorrhage just like the mother's.

The present patient had had frequent subcutaneous hemorrhages for two years, followed by violent epistaxis and vesical intestinal hemorrhages. Three days after the extirpation of a chalazion, which had been followed by very little bleeding, and when the incision had cicatrized, there was profuse bleeding from the conjunctiva. The blood coagulated quickly and firmly.

The condition differed from hemophilia, which is a congenital anomaly, while the first hemorrhage occurred in this patient's case after she had passed her fifty-seventh year. In hemophilia also the hemorrhage has nearly always a traumatic origin, while in this case traumatism was followed by very little bleeding.

Some symptoms of hysteria appeared at the time of the hemorrhage, but had not existed before.

G. C. H.

THE EYE CHANGES IN NEPHRITIS IN CHILDREN. STEPHENSON (*British Medical Journal*, Sept. 21, 1907). At the British Medical Association's meeting Mr. Sydney Stephenson spoke on the above subject in the discussion on acute nephritis in children and its results. He states that ocular complications appear to be uncommon in acute diffuse nephritis, and, though he made a point for several years of examining the fundus oculi in all cases of acute nephritis, the only change he has found was bilateral papillitis. He gives notes of two cases and says the fundus appearances in both might, however, readily have been mistaken for those produced by an intracranial lesion. In chronic nephritis the ocular changes assume two types—retinitis often accompanied by multiple hemorrhages and a second from papillitis. A third class, formed of a combination of the two—a neuroretinitis type, and a fourth class, a retinitis associated with retinal attachment, are further but less distinctive lesions. The prognostic significance of retinal changes in young subjects, he considers, may be actually graver than in adults. He sums up the paper under the following heads:

1. That ocular complications are uncommon in cases of acute nephritis, and that when they occur they usually assume the form of an inflammation of the optic papilla.

2. That retinal complications are apparently much less frequent in parenchymatous than in intestinal nephritis.

3. That the ophthalmoscopic signs do not appear to differ either quantitatively or qualitatively in the two forms of chronic nephritis.

4. That detachment of the retina may occur as a complication of retinitis in childhood.

5. That the significance as regards duration of life is as unfavorable in the renal retinitis of children as in that of grown-up persons.

A. A. B.

OCULAR LESIONS IN THE SPONTANEOUS MYXEDEMA OF ADULTS. —MME. L. GOURFEIN-WELT (*Archives d'Ophthalmologie*, September, 1907). Myxedema is characterized by a peculiar infiltration of the skin, atrophy of the thyroid body and diminution of the intellectual faculties—all symptoms easy of observation.

The ocular complications, however, have been little studied. One of the most noticeable of these is the myxedematous infiltration of the skin and conjunctiva of the eyelids. All observers of cases of myxedema speak of the puffiness of the eyelids as one of the earliest of the symptoms, and, according to Chapman, infiltration of the palpebral conjunctiva is a diagnostic symptom of myxedema. He

maintains that this infiltration, if there is no local cause, must be attributed either to nephritis or myxedema, and that, therefore, an examination of the urine will determine the diagnosis.

The other symptoms that have been noted are epiphora, the ophthalmoscopic appearance of albuminuric retinitis, retinal hemorrhage, edema of the retina and optic atrophy with restriction of the visual field.

In the case reported by the author there was hemianopsia—the temporal half of the visual field being abolished. A great and rapid improvement following treatment by thyroid extract confirmed the diagnosis of myxedema as opposed to that of acromegalia which the ocular symptoms suggested. The author quotes a number of cases from literature in which temporal hemianopsia existed and agrees with the explanation of Mayer that there is a compensating hypertrophy of the pituitary gland consecutive to the atrophy of the thyroid, and resulting compression of the chiasm.

Virchow and others have determined a strong resemblance in the histologic structure of the thyroid and pituitary glands, and Ewold and Schnitzler maintain that there is a functional compensatory action between them. Ragowitz has proved experimentally that extirpation of the thyroid causes hypertrophy of the pituitary body, and postmortem examination in several cases of myxedema has shown atrophy of the thyroid and hypertrophy of the pituitary.

G. C. H.

A CASE OF HEMORRHAGIC HODGKIN'S DISEASE WITH SYMMETRICAL LYMPHOMATA OF THE CONJUNCTIVA.—GOLDZIEHER, Budapest (*Graefe's Arch.*, lxxviii, H. 1, November, 1907). The patient was a male, 45 years of age. The tarsal conjunctiva was markedly congested, of a raspberry color. The vascular network was distended and the vessels tortuous. The conjunctiva was smooth. On evert-ing the lid the retrotarsal fold in its entire length was involved in a cylindrical tumor of deep red color. There were iritic synechiæ. The principal features in the case were: 1. Traces of preceding iritis in one eye and occlusion of the pupil in the other. 2. Extensive distribution of lymphomatous tumors with uninvolve-ment of the liver and spleen. 3. Lymphomatous formations in the retro-tarsal folds of one eye and of the inferior fold of the other eye. The orbital tissues and lacrimal glands were normal. The glandu-lar tumors were of a hyperemic-hemorrhagic character. The author points out the difference between the affection and lymphomatous conjunctivitis and involvement of the conjunctiva in pseudo leu-kemia. He says that his case presents so many variations from Mikulicz's disease that it forms a new clinical entity.

W. Z.

GLAUCOMA.

SOME EXPERIENCE WITH SIMPLE GLAUCOMA AND CONCLUSIONS THEREFROM ON THE RELATIVE VALUE OF OPERATIVE AND NON-OPERATIVE TREATMENT.—YOUNG, H. B., Burlington, Iowa (*Ophthalmic Record*, December, 1907). He accepts the standard of Schweigger that "a dilated sluggish pupil and shallow anterior chamber precluded the diagnosis of simple glaucoma, meant, on the contrary, inflammatory glaucoma, dormant perhaps, but still inflammatory glaucoma," or Abadie's declaration, "that simple glaucoma was glaucoma of the posterior segment of the globe." He believes that the persistent use of miotics is of more service than operation; that a tension that is doubtful to the educated touch, but still too great for the nerve to bear with safety, should first indicate a nerve too far from normal to bear ordinary pressure.

M. B.

GLAUCOMA AFTER CATARACT EXTRACTION WITH IRIDECTOMY.—BULSON, A. E., JR., Fort Wayne, Ind. (*Ophthalmic Record*, November, 1907). Two cases are reported in elderly subjects who were operated on for cataract with iridectomy who developed glaucoma in about a month after the operation. The eyes were lost and had to be removed. In both cases the immediate results were satisfactory and good vision was obtained. The pupillary spaces were clear, and the colobomas normal and large. No incarcerations. Microscopic examinations showed this to be true. The glaucoma was accounted for by cyclitis and changes in the fluids of the eye, which could not be eliminated at the excreting angle. M. B.

ON SO-CALLED FILTERING CICATRICES IN THE TREATMENT OF GLAUCOMA.—HENDERSON, THOMAS, Nottingham (*Ophthalmoscope*, December, 1907). The success of operation in glaucoma does not lie in a "filtering" wound, but in the accompanying iridectomy. After an incision into the anterior chamber the endothelial cells grow along the internal margin of the wound and so come to seal it off. Once the growth of endothelium is complete, the wound is no more a filtering cicatrix, but is shut off from the anterior chamber by a layer of new formed endothelial cells which proceed to lay down a new homogeneous membrane between the cut surfaces of Descemet's membrane. It is this endothelium that precludes all possibility of a permanent filtering cicatrix following any operative incision, however devised. The reason of the beneficial action of iridectomy in glaucoma is accounted for by the fact that the cut iris surface forming the base and pillars of the coloboma never undergoes any reparative process, but always remains a low, open

wound, as when first severed, so acting as a permanently open filtering area. The efficiency of this drainage area depends on the operation being done before atrophy of the iris stroma has progressed too far.

M. B.

TREATMENT OF CHRONIC GLAUCOMA BY COMBINED IRIDECTOMY AND SCLEROTOMY.—LAGRANGE (*Archives d'Ophthalmologie*, July, 1907) gives a report of additional cases treated by the operation that he has described in these *Archives* in 1906, and claims that the results are much more favorable than by the ordinary iridectomy. He describes chronic glaucoma as a disease essentially characterized by hypertension. The hypertension is moderate in degree and may be so slight as to be difficult to demonstrate, and besides may be intermittent and non-existent at the time of examination. In such cases the diagnosis may be established by the history, the colored circles about lights, transient diminution of vision, etc., or by the characteristic constriction of the field with relative preservation of the color field. When a patient with excavation of the papilla has the field constricted on the nasal side, but the color fields retained in exact proportion where acuity is preserved, he is glaucomatous. He may not have hypertension at the time of examination, but he has had it from time to time as a result of emotion, overwork or some physical or moral fatigue. When the patient has frequent painful crises, during which the eye becomes much congested, the glaucoma is acute; when the crises are less marked, but still accompanied by congestion, it is subacute; when the crises are too slight to cause any pain or apparent congestion, the glaucoma is chronic. He excludes all varieties of amaurosis with excavation in which hypertension is not the essential phenomenon. He claims that the effect of simple iridectomy is transient, but that he gets a permanent diminution of tension by his operation.

G. C. H.

IS IRIDECTOMY OR SCLEROTOMY TO BE CONSIDERED THE NORMAL OPERATION IN HYDROPHTHALMOS?—STÖLTING, Hanover (*Graefe's Arch.*, lxxvii, i, November, 1907), from his experience, strongly favors sclerotomy. He says that early cases of hydrophthalmos, provided the degenerative process has not advanced too far, are, in general, curable through sclerotomy alone. In more advanced cases also the operation suffices. He believes that so long as the tension is increased the case should be treated operatively.

W. Z.

INJURIES.

TRAUMATIC EDEMA OF THE CORNEA IN THE NEW-BORN INFANT.—BRAV, AARON, Philadelphia (*N. Y. Med. Jour.*, Sept. 14, 1907).

The writer records an instance of this affection which was with difficulty distinguished from (1) congenital corneal opacities resulting from a keratitis *in utero*; (2) anomalies of the cornea due to faulty embryonic development; (3) keratitis superficialis, and (4) hydrophthalmus.

The infant had been delivered with forceps and was seen by the writer 36 hours after birth. There was slight discoloration of the upper lid of the affected eye and a small laceration at the external angle. The eyeball appeared markedly enlarged and was bulging. There was a small area of subconjunctival hemorrhage below the cornea, but no evidences of inflammation and no edema of the conjunctiva. The eyeball appeared larger, the cornea was manifestly larger than in the corresponding eye, and the eyeball was markedly proptosed. The cornea had a conical shape with the summit in the center, was smooth and of shining luster, but nearly the entire surface was covered with a bluish white opacity, excepting the periphery, where the clear cornea was seen about 3 mm. through the entire circumference. The opacity was most dense in the center, shading toward the margin; it was circular in shape, covering the entire pupillary area. The iris could be seen through the clear periphery, responded to light, but fundus reflex was not obtainable.

Six days later the cornea was clear, the eyeball assumed the normal shape and position, fundus reflex was well seen, the cornea was of good luster, the opacity had entirely disappeared. The treatment employed was 1 per cent. solution of dionin.

C. H. M.

LUXATION OF THE EYEBALL IN A NEW-BORN INFANT.—FAGE (*Archives d'Ophthalmologie*, August, 1907). The delivery had been natural without the use of instruments or force, and the dislocation was attributed to a contusion in the lower abdominal region by the end of a shaft that the mother had received the day before the birth of the child.

G. C. H.

BLINDNESS FOLLOWING THE INJECTION OF PROTARGOL IN LACRIMAL SAC.—LEWIS, F. PARK, Buffalo (*Ophthalmic Record*, December, 1907). A woman of 50 years, having about passed through an attack of acute dacriocystitis, a 25 per cent. solution was injected into the sac and was repeated on the day following. Shortly after going home, great pain developed, with orbital cellulitis and proptosis, followed by the optic atrophy.

M. B.

RUPTURE OF THE PECTINATE LIGAMENT.—BUCHANAN, LESLIE, Glasgow (*Ophthalmoscope*, November, 1907). Rupture of the pec-

tinuate ligament allows the ciliary body to slip backward at the same time drawing upon the iris, then causing pupillary distortion and a deepening of the anterior chamber in the region of the pectinate rupture. The lesion is usually caused by a blow on the eye from a blunt instrument without rupture of the globe. An hyphema usually follows at once, which, after absorption, presents the above picture. The canal of Schlemm usually becomes obliterated and increased tension is a symptom which finally develops and ultimately demands excision of the eye. M. B.

ACCIDENTAL RECOVERY OF VISION IN BLINDNESS IN A CASE OF EPITHELIOMA OF THE CONJUNCTIVA.—DUJARDIN, Lille (*Die Ophth. Kl.*, Sept. 20, 1907). In a case of epithelioma of the bulbar conjunctiva where the entire anterior aspect of the globe had become buried in a tumor mass and vision with the eye rendered impossible, the sight was accidentally restored by the patient being struck in the affected eye by the branch of a tree, which had caused profuse bleeding from the growth and had torn part of it away from its position in front of the cornea. The author says that the case bears out Valude's statement, that limbus epithelioma tends to remain extraocular and almost never perforates the capsule of the eye. Practically it teaches that in similar cases the condition of the cornea should be examined into by exposing the central portion of this membrane, thereby in some cases avoiding the sacrifice of the eye. W. Z.

INJURIES TO THE ORBIT.—BOHM, Heilbron (*Die Ophth. Kl.*, Oct. 20, 1907), states that the mode of entrance of foreign bodies into the orbit is usually through the anterior aspect, because of the protection afforded by the bones to the side walls. The inner angle is more often injured than the outer; more rarely the space between the globe and the roof, and very rarely the space between the ball and the floor, as the two latter are very narrow. Occasionally it reaches the orbit through the globe. Several instances of foreign body in the orbit are given. One is of especial interest, because of the length of time it had been in without causing symptoms. Fifteen years previously a piece of slate pencil had entered the orbit. In the past three years the eye had become inflamed and a growth appeared at the site of injury in the conjunctiva. This was removed, but repeatedly recurred. An x-ray showed the foreign body to be in the superior maxillary bone. At the operation this was found to be incorrect, the foreign body being found in the orbital fat at the floor of the orbit.

The author states that in all previously reported similar cases there were symptoms which pointed to the presence in the orbit of a foreign body.

W. Z.

ON OPACITIES OF THE CORNEA CAUSED BY METALLIC CAUSTICS AND AN IMPROVED METHOD OF CLEARING THEM.—GUILLERY, H. Coeln (From the bacteriological laboratory of the City of Coeln. *Archiv. fuer Augenheilkunde*, lviii, p. 77). The important discovery by Guillery of clearing up corneal opacities of the cornea, produced by lime, by solutions of ammonium chlorid (reviewed in OPHTHALMOLOGY), has not found the general recognition it deserved. In the meantime the author has been incessantly engaged in further pursuits to extend his method also to affections caused by other metallic caustics and to elucidate their nature. These were partly embodied in his great work, "Lewin and Guillery: The Actions of Drugs and Poisons on the Eye, Berlin, 1905," and in several essays in the *Archiv. fuer Augenheilkunde*, of which the present is the latest. He reports his investigations on the actions of lead, sulphate of copper, corrosive sublimate, nitrate of silver, baryte, lime, hydrates of sodium and potash, and ammonia on eyes of dead and living animals. By his methodical and carefully planned microchemical researches he succeeded in giving a most accurate exposition of the morphological and chemical changes in the cornea and the means of their removal.

We also find a new contribution to the explanation of the still disputed chemical nature of opacities of the cornea caused by lime. Guillery shows that in these conditions two things must be distinguished: 1. The tissue changed by lime; 2, lime in substance, chiefly carbonate of calcium, which either remains unchanged or becomes carbonated in the cornea through contact with the air. While the carbonates are of inferior importance, our therapeutic efforts must be directed to the organic combination formed by lime with the living tissue. They were unsuccessful until Guillery found in ammonium chlorid a means of dissolving them. This may be considerably improved by adding 0.1 per cent. tartaric acid to a 10 per cent. solution of ammonium chlorid, which, as autoexperiments showed, is perfectly harmless to the human eye. Inflammatory conditions are no contraindication to its application. The brown discoloration from nitrate of silver can be removed by a 10 per cent. solution of thiosulphate of sodium, while for discoloring the remaining unreduced silver combinations the mixture of ammonium chlorid with tartaric acid proved most efficient. The microchemical changes are illustrated by photogravures on three plates.

Guillery's elaborate and practically important essay, with its clear argumentation and lucid description of his exact methods, is urgently recommended for a closer study. C. Z.

PIECE OF STEEL TOLERATED IN THE IRIS, WITHOUT IRRITATION, FOR TEN YEARS.—BERGMEISTER, Wien (*Centralblatt fuer Augenheilkunde*, September, 1907, p. 257). A man, aged 28, stated that, ten years previously, in a duel exercise, a piece of steel from a sword had entered his right eye without causing any further trouble. There was no trace of siderosis, but ciliary injection at the upper medial quadrant and discoloration of the iris. A small black foreign body was seen at the root of the iris at the upper medial quadrant and, corresponding to it, a minimal scar of the cornea. As the pain increased and an exudation near the foreign body had developed after four days, with dilated blood vessels at the lesser circle, iridectomy was performed at that point. The excised piece of iris did not contain the foreign body, which could not be detected in the anterior chamber, on account of a profuse hemorrhage, nor after recovery.

About six months later the patient noticed, after riding on horseback for several hours, a brown spot on the iris at the lower side of the coloboma, with a central black line, and returned to Bergmeister. Apparently the foreign body had, during iridectomy, been wiped off and remained in the wound canal. Through the concussion in horseback riding it was dislodged and had wandered into the anterior chamber along the side of the coloboma. The sideroscopic examination was negative, but the giant magnet, at maximal intensity, pulled this part of the iris forward, indicating the presence of iron. The foreign body was removed by another iridectomy. Chemically it proved to be iron, weighing 0.0008 gram.

The author believes that asepsis, small volume and weight, seat on the anterior surface of the iris and favorable condition of the perforation wound, give the explanation for the peculiar fact that the foreign body did not only heal in, but was tolerated for years without irritation. He differs in this from E. Bock, who attributed it to the chemical constitution (coal and wood) in his two cases (*Centralblatt fuer Augenheilkunde*, March, 1907). C. Z.

ANNULAR OPACITIES OF THE ANTERIOR SURFACE OF THE LENS FROM CONTUSIONS.—CASPAR, L. Mühlheim a. Rh. (*Klinische Monatsblaetter fuer Augenheilkunde*, xlv, ii, 1907, p. 425). Two cases are reported which showed in all details perfect similarity to the type described by Vossius. In the first case a piece of iron

flew against the left eye of a man, aged 19, causing abrasion of the epithelium of the cornea, hyphemia, irregular mydriasis. The next day a gray annular opacity of 4 mm. diameter was seen at the center of the anterior surface of the lens. With the ophthalmoscope and strong convex glasses it appeared to be composed of very fine dark dots in or closely behind the capsule. The peripheral outlines were more marked than those toward the center. The retina showed Berlin's opacity. Everything had disappeared after a week.

In the second case the opacity had the form of a disc and was caused by a contusion through a piece of wood. There was also edema of the retina. Restitution took place within a week.

C. Z.

SPONTANEOUS BURSTING OF A DOUBLE-WALLED ARTIFICIAL EYE.—BEAL (*Annales d'Oculistique*, December, 1907) reports a case in which a "reformed" artificial eye (one with double walls enclosing a cavity) burst with quite a loud report without evident cause, and quotes a similar case recorded by Dr. Milliken, of Cleveland. His explanation of the accident is that the high degree of heat used in the manufacture of the eye produced a vacuum in its cavity and that a crack in the very thin posterior wall, probably the result of a strong contraction of the orbicularis, admitted the external air and caused the explosion. For the prevention of the accident he proposes making a small hole in the posterior wall to equalize the pressure.

G. C. H.

INSTRUMENTS AND METHODS.

A FIXATION FORCEPS.—KOSTER, W., Leiden (*Zeitschrift fuer Augenheilkunde*, xviii, December, 1907, p. 521). The ends are bent off, like an iris forceps, under an angle of 45° , in order to bring the hand of the operator more into the periphery of the field of operation. The teeth form an angle of 90° with the ends of the forceps, so that the forceps touches the globe in almost tangential direction, without tearing its walls.

C. Z.

AN IMPROVED ENTROPION FORCEPS.—EWING, ARTHUR E., St. Louis (*Ophthalmic Record*, October, 1907). This instrument is self-retaining. Its blades are very spacious and made of steel piano wire 1 mm. in diameter. To the lower blade is fastened a plate 10 mm. broad. The forceps are intended to be placed in position when used on the upper lid after the lid is everted. The author's operation for entropion is illustrated and described minutely, but unfortunately does not lend itself to abstract.

M. B.

A NEW PROCEDURE AND INSTRUMENT FOR THE ARTIFICIAL MATURATION OF CATARACT. CLAIBORNE, J. H., New York (*New York Med. Jour.*, Dec. 14, 1907). The writer describes Mooren's procedure for artificially ripening cataract, consisting of (1) an iridectomy; (2) subsequent dilation of the coloboma with atropin; (3) a dissection of the lens capsule with the dissection needle, at the end of eighteen to twenty-one days, and (4) extraction of the lens later. He then describes a modification which he has tested with favorable results on one case: Immediately following a broad iridectomy, the anterior capsule was scratched with an instrument constructed somewhat like a lance-shaped keratome and having six sharp needle points on its under surface; in drawing this instrument across the face of the capsule three streaks are cut in the capsule, the points in the rear finishing and complementing the work of the anterior ones. Subsequently the patient had a mild attack of iritis. Sixteen days after artificial ripening the cataract was extracted by corneal section. A mild attack of iritis again developed, but the final result was satisfactory.

Mooren states that the cases in which this procedure is to be employed should be selected, and that those should be avoided in which there is arteriosclerosis, for it is well known that such cases are more apt to be attacked by glaucoma than others. The writer claims that his procedure is simpler than Mooren's and occupies less time, and he would recommend the use of atropin several hours before the first procedure. He suggests the employment of the same procedure in the surgical treatment of high myopia.

The advantages claimed for this method are: (1) greater ease in lacerating the capsule; (2) greater area of laceration; (3) the less likelihood of iritic complications and the less extensive if they do occur; (4) the presence of a coloboma to forestall the occurrence of glaucoma or its relief in case it does occur; (5) the less likelihood of postoperative glaucoma; (6) simplification of the final extraction.

C. H. M.

OPHTHALMOSCOPY OF THE CILIARY AND RETROCILIARY REGION. —TRANTAS (*Archives d'Ophthalmologie*, September, 1907). It is generally admitted that the ciliary region is not accessible to ophthalmoscopic examination. According to Groenow and Dimmer, examination is practicable only to within 8 mm. or $8\frac{1}{2}$ mm. of the limbus; therefore, not only the ciliary region, but the ora serrata and a part of the chorioid and retina of 1 mm. to $1\frac{1}{2}$ mm. are considered invisible.

The author claims that by digital pressure of the region from

the equator to the root of the iris while examining by the erect image with a $+4$ D. to $+8$ D. glass it is possible to see perfectly not only the extreme periphery of the chorioid and retina, but the ora serrata and the ciliary arch even to the ends of the ciliary processes.

Next to the posterior pole this region is the most vulnerable part of the fundus, as it is most important in the nutrition of the eye, and it comprises nearly a quarter of the whole fundus. G. C. H.

TEST CARD FOR THE ILLITERATE.—OLIVER, CHARLES A., Philadelphia (*Ophthalmic Record*, November, 1907). The characters are all alike and are hollow squares, of which one side is open. They are of different sizes corresponding to the letters on the usual Snellen cards. The openings of the squares are arranged to point up, down, in and out, and the patient is asked to indicate the direction thereof. M. B.

THE "HOGUE-CALIFORNIA" TRIAL FRAME.—EATON, F. B., Portland, Oregon (*Ophthalmic Record*, October, 1907). This frame is at present illustrated in Meyrowitz's catalogue, but has been further perfected. It was originally devised by Mr. Charles Hogue, of San Francisco, and was brought out by the California Optical Company. It is held in position by a spring band passing from the back of the head forward over the top of the head to the forehead. The trial frame is fastened to a forehead plate and has every possible adjustment. M. B.

THE LOCATION OF FOREIGN BODIES IN THE EYE WITH THE X-RAY, WITH DESCRIPTION OF A NEW APPARATUS.—LE FEVRE, WALTER IRWIN, Cleveland. (*N. Y. Med. Jour.*, Oct. 19, 1907.) The writer says that a lateral and anterior-posterior radiograph would be ideal but impractical on account of the bony structure of the skull; hence all practical methods comprise the taking of two radiographs at different angles through the head from side to side. The method described is based upon such lateral views at different angles; it is not claimed that the method is new, but the apparatus for accomplishing it is.

The patient lies on his side, with the injured side next to the plate holder, which has a little hinged trap door, allowing the plate to be placed upon it and then locked into place; in this way the plate can be changed without moving the patient. The "land marks," or guide wires, are pasted upon the patient with adhesive plaster, the wires crossing at the outer canthus and dividing the eyeball into quadrants. The wire pointer is arranged so that the pointer is in front of the pupil. With this method the cross-roads

are in contact with the plate and as near the eye as it is possible to get them. The position of the cross wires as they touch the plate will be the same in both views. After the first picture is taken the plate is changed and the paddle with the tube in the tube holder shifted to exactly the same angle on the other side of the perpendicular.

"When the two views are taken in this way we have a perfect pair of stereoscopic pictures. If viewed through a stereoscope the foreign body will stand out in relief so that its position can be located; however, the stereoscope is not necessary, as the position can be readily calculated by measuring the distance the foreign body has moved on the two plates. We know the angle from which the source of the light comes. Lines are drawn from the source to the respective points of the shadow on each plate. Where these lines cross will indicate the distance of the body from the plate or where the wires cross. Both radiographs will show its distance posterior to the marker in front of the pupil. The mean distance between the two shadows will show its exact position relative to the horizontal wire. Then we have its distance from the plate, its depth back of the pointer in front of the eye and its distance above or below the median line of the eye. The cross wires can be fastened to the face or stretched across the little table. When placed on the face they can be left in position until the measurements are made."

C. H. M.

AN APPARATUS AGAINST THE DISTURBING INFLUENCE OF ELECTRIC STREET CARS ON SIDEROSCOPES.—KOSTER, GZN., Leiden (*Archiv. fuer Augenheilkunde*, lix, p. 49), observed that the north pole of the sideroscope was always attracted by the street current. He, therefore, kept this pole turned toward the street current by hanging the magnetic needle of the sideroscope vertically to the current by means of a small artificial magnet, and thus produced an artificial magnetic meridian vertical to the street current. This meridian is the resultant of the forces of the artificial magnet and the earth magnetism. The influence of the street current was removed and the reaction of the sideroscope very intense, as a piece of steel of 3 mg., 9.75 cm. distant, caused a deviation of 20 points. The required magnet may be procured from H. Brouwer, engineer of the eye clinic.

C. Z.

LACRIMAL DISEASE.

A CASE OF DACRIOCYSTOBLENNORRHEA CURED BY INTERCURRENT ERYSIPELAS OF THE FACE.—OSOLIN, J., Dorpat (*Centralblatt fuer praktische Augenheilkunde*, 1907, p. 353). A man, aged 27,

had purulent dacriocystitis on both sides. A fistula on the left side was opened and it was found that the walls of the tear sac had been destroyed by suppuration, so that no extirpation *en toto* was possible. The remnants of mucous membrane were removed, the tear duct scraped and the wound closed by sutures. These were removed on the sixth day. On the eighth day the wound was so far healed that a tenotomy of the left internal rectus for convergent strabismus could be performed. When the patient was ready to leave the clinic he did not feel well, had 39°, and a characteristic erysipelas developed on the face, head and neck. A yellowish fluid from the scar at the left lacrimal region contained great quantities of streptococci. After recovery the right dacriocystitis was perfectly cured, no pus was there, and the strictures had also disappeared, so that a probe could be introduced without impediment. At an examination three months later no trace of the lacrimal affection could be detected. The author could not find a similar observation in literature.

C. Z.

LENS.

CONTRIBUTION TO THE SYMPTOMATOLOGY OF PHAKOLIE. KRAMER, Vienna (*Gräfe's Arch.*, lxvii, II, 1, November, 1907), points out that Birnbacher chose this term because the three classical postulates, hernial ring, sac and contents were, respectively, represented by the margin of the perforation, capsule and iris and lens substance. He states, however, that the capsule, being a part of the lens, belongs rather to the contents than to the sac and can not be likened to the peritoneal covering of the intestinal hernia. He gives two groups: those following ulceration and those following trauma. For the production of the first class the favoring conditions are: small central perforation, soft (juvenile) lens and intact zonule. For the second group these conditions are the least favorable for its production. After rupture of the cornea, hernia of the lens is as rare as total luxation of the lens.

W. Z.

LIDS.

THE PROGNOSIS OF MALIGNANT PUSTULE OF THE EYELIDS.—MORAX (*Annales d'Oculistique*, November, 1907), after an analysis of fifty recorded cases of malignant pustule of the eyelids, concludes that its prognosis is not more grave than that of the disease occurring in other localities. The percentage of mortality is about 30. In spite of the extensive edema, the infection seems to be usually limited to the skin.

G. C. H.

THE ETIOLOGY OF CONGENITAL ENTROPION. LEBLANC (*Archives d'Ophthalmologie*, December, 1907) concludes, from the

study of a case that he reports and of other recorded cases, that congenital entropion may be due to malformation of the conjunctiva or the tarsus or to hypertrophy of the palpebral portion of the orbicularis.

G. C. H.

MATERIA MEDICA AND THERAPEUTICS.

NOVOCAIN IN LOCAL ANESTHESIA.—SCHLEY, W. S., New York (*N. Y. State Jour. of Med.*, December, 1907). The writer says that since the introduction of cocain constant attempts have been made to find the ideal local anesthetic: a non-toxic, non-irritating substance whose only action would be to paralyze the peripheral sensory nerves. Anesthesin, the eucains, hemacain, tropacocain, alypin, stovain and many others followed, and, lastly, we have novocain. Anesthesin was not sufficiently soluble, the eucains were weak, alypin and stovain were better, but not entirely free from irritation, were still about a third as toxic as cocain and not sufficiently potent.

Novocain appears to be the best substitute so far produced. It is a white crystalline synthetic salt, soluble in one part water, and can be boiled repeatedly without decomposition. A résumé of Biberfeld's study of its physiologic action is given; this experimenter found novocain exerted the same action on the peripheral nerves as cocain and a $\frac{1}{4}$ per cent. solution rendered the sciatic of the rabbit insensitive in ten minutes. In the cornea much stronger solutions were required and the action was not so prompt nor so powerful as cocain. The internal muscles of the eye were not affected by a 5 per cent. solution. Novocain was shown to be about one-sixth as toxic as cocain and one-half to one-third as toxic as stovain.

The writer's own experience showed that very dilute solutions of novocain do not compare with equally dilute solutions of cocain, but after 2 per cent. strength the difference is much less marked hypodermically. Suprarenalin has a very marked enhancing value even in dilute novocain solutions; a $\frac{1}{4}$ per cent. novocain with suprarenalin is twice as powerful as the 1-5000 Schleich cocain solution.

He conducted a number of experiments on animals to determine the toxicity of novocain and found it to be exactly one-sixth that of cocain (given hypodermically). He concludes that novocain is of low toxicity and of potency nearly equal to cocain in the higher strengths (2 to 4 per cent.) when used subcutaneously. In these strengths, when combined with adrenalin solution 1-1000, in the proportion of 5 to 10 of novocain to 1 of adrenalin, we have a very

safe local anesthetic of rather remarkable power and diffusion. Upon mucous surfaces novocain does not appear to compare with cocain, being slow and imperfect; this peculiarity of novocain is rather unfortunate, as a local anesthetic of low toxic power would here prove of great value, as we are most apt to see poisoning after applications to the nasal mucosa or urethra and bladder, the small $\frac{1}{2}$ and 1 per cent. solutions of cocain now usually used hypodermically rarely causing toxic action.

The chief advantages of novocain are the perfect sterilizability of the solutions by boiling, the excellent keeping qualities of the solutions, the very low toxicity of the drug (of value in using larger amounts), and the remarkable diffusive action of the combination of novocain and active suprarenalin solution. C. H. M.

NOVOCAIN AN ANESTHETIC IN OPHTHALMIC PRACTICE.—WIEHERKIEWICZ (*Postep okulistyczny*, No. 1, 1907). On account of certain untoward and well-known effects of the well-known local anesthetic, cocain, better substitutes for this drug are to be desired. Professor Wieherkiewicz has had many such proposed substitutes sent to him from the firm of Meister, Lucius and Brünning of Höchst; of these novocain is the last. His experiments show that novocain is less toxic than cocain; 1 to 2 per cent. solutions anesthetize the cornea very well. It does not affect the pupil or accommodation, nor does it cause hypotony. The last property seems to be of benefit for cataract extraction. The expulsion of the lens seems easier than under cocain, but coaption of the edges of the wound and restoration of the anterior chamber took some days. He had especially good results in subconjunctival and subcutaneous injection of novocain, also in operations on the ocular muscles and for enucleation. He advises novocain as a constituent for the Schleich formula for infiltration anesthesia. For conjunctival and corneal operations cocain is yet preferred.

K. W. M. (TRANS. H. V. W.).

OCULAR ANESTHESIA BY ALYPIN. FRANK, ISAIAH, New York (*The Amer. Jour. of Ophthalmology*, November, 1907). The writer mentions the objectionable features of cocain, viz.: toxic effects, idiosyncrasy, drying effect and destructive influence upon the corneal epithelium, prolonged mydriasis, effect upon accommodation and increased tension. This explains the fact that a number of substitutes for cocain have been recommended. Among the latest of these is alypin, which has been made the subject of extensive experiments by ophthalmologists, so that it is possible to form a clear idea of its merits as compared with cocain. From the con-

siderable literature that has been published it would appear that it is practically identical in efficiency with the latter and has certain advantages which give it preference in many cases. In the solutions ordinarily used it is said not to dilate the pupil nor interfere with the accommodation, and to be free to a great extent from the drying effect of cocain upon the corneal epithelium.

The writer employed alypin in various examples. Tests were made to determine the rapidity with which surface anesthesia was obtained and its duration, using a 4 per cent. solution; the average time was twenty-five seconds and the duration one to two minutes. The penetration of alypin anesthesia into deeper structures was demonstrated in chalazion and trachoma; in the former instillation and subcutaneous injection of a 4 per cent. solution caused perfect local anesthesia; in the latter, after rubbing a 4 per cent. solution into the conjunctiva with cotton upon a toothpick, the follicles were squeezed out with Knapp's roller forceps with comparatively little resistance on the part of the children. In strabismus cases, both tenotomies and advancements were performed under perfect local anesthesia. In one case of cataract extraction a 4 per cent. solution gave perfect results.

The paper concludes with the statement that these cases demonstrate that alypin is a local anesthetic which is quite permanent in solution, prompt in its action and lasting in its effects, without any of the annoyances of mydriasis or accommodative interference, not giving rise to considerable irritation or damage of the corneal epithelium and permitting us to dispense with general anesthesia

C. H. M.

A CRITICAL STUDY OF ORGANIC PREPARATIONS OF SILVER IN THE TREATMENT OF CONJUNCTIVITIS.—KELLY, JOHN MUIR, Glasgow (*The British Med. Jour.*, Nov. 2, 1907). Since the introduction of argyrol and protargol there has been among clinical observers a great difference of opinion regarding their efficacy in diseases of the conjunctiva. Many have described them as being superior to silver nitrate, but others have regarded them as "bland, harmless and inefficient." During the past year a series of experiments have been performed with these preparations and with silver nitrate to ascertain their several bactericidal powers. One realizes that in a laboratory it is impossible to reproduce exactly the conditions found in Nature, but as the same methods were used with each substance the results have at least a comparative value. The organism used was *Staphylococcus pyogenes aureus*, because it was

easy to identify and because it gave results that were remarkable for their consistency.

As a result of fifty experiments with silver nitrate, it was found that a 0.0039 per cent. solution killed the organism in five minutes, and a 0.0019 per cent. solution killed it in ten minutes, but a 0.0009 per cent. solution did not kill the organism even after a twenty minutes' exposure.

Forty-nine experiments were performed with protargol, when it was found that a 1 per cent. solution killed the organism in five minutes, and a 0.5 per cent. solution in ten minutes, but a 0.25 per cent. solution even after twenty minutes' exposure did not prevent a growth appearing on the first day.

Regarding argyrol, after the organism had been exposed to 50 per cent. solutions for one, two, three and twelve hours, a growth was obtained on the first day, but after a twenty-four hours' exposure no growth was present even on the tenth day. Thus, a 50 per cent. solution required about twenty-four hours to kill the organisms.

The bactericidal powers of these preparations have recently been investigated by Marshall and Neave, and by Derby. The results obtained by these observers varied somewhat according to the methods employed, but on the whole they agree with the figures given in the present paper; and all these results show conclusively that as a bactericidal agent silver nitrate is very strong and is superior to protargol, whilst argyrol has only very faint bactericidal properties.

In conjunctival infections the germs such as the Koch-Weeks bacillus and the gonococcus are often intracellular and more or less deeply imbedded in the tissues; consequently the bactericidal agent will not be efficient unless it has power to penetrate the tissues. Accordingly an attempt was made to compare the combined diffusible and bactericidal properties of protargol and silver nitrate. As a result of over seventy experiments made on these lines it was found that a 0.5 per cent. solution of silver nitrate killed the organisms in thirty minutes, a 0.75 per cent. solution killed them in twenty minutes, and a 1 per cent. solution required ten minutes to kill them. A 5 per cent. solution of protargol and a 10 per cent. solution failed to kill the organisms in thirty minutes, but a 20 per cent. solution killed them in that time. A 30 per cent. solution killed them in twenty minutes.

From these experiments we may conclude that protargol has greater powers of diffusion than silver nitrate, but these do not

sufficiently compensate for the superior powers of the latter, which are about forty times as great as the former when we allow for penetration, and 263 times as great when we consider bactericidal power alone. As for argyrol, as it has previously been found to be almost inert, a culture was immersed in a 5 per cent. solution for twenty-four hours and from it a growth was obtained on the first day.

Speaking of the staining tissues, it has long been recognized that one disadvantage of using silver nitrate is its tendency to stain the cornea and conjunctiva. It was claimed for the organic preparations of silver that they did not stain the conjunctiva, but since they have been extensively used several cases of argyrosis have been reported. The writer reports a case of staining from protargol and another in which the tissues of the lower lid presented marked argyrosis after two years, following the injection of a 20 per cent. solution of argyrol into a false passage during the treatment of dacryocystitis.

Regarding the pain accompanying the use of these remedies, a 0.5 per cent. solution of silver nitrate and a 20 per cent. solution of protargol causes an equal amount of pain, but the discomfort of silver lasts much longer than that of protargol. Argyrol is quite bland and soothing.

The writer gives the comparative results of the treatment of a series of cases of Koch-Weeks conjunctivitis, reporting that the duration of the disease is not shortened by the mode of treatment; that protargol, on account of its irritating properties, often does more harm than good; whilst argyrol, being bland and mildly astringent, is beneficial, in so far as it lessens the patient's discomfort, and that all the treatment necessary for this form of conjunctivitis is keeping the conjunctival sac as clean as possible by washing it out frequently with normal saline solution.

In the treatment of conjunctivitis due to the Morax-Axenfeld diplobacilli, protargol and argyrol proved to be quite inefficacious, but zinc sulphate quickly cured the disease; the most brilliant results were obtained with an 8 grains to the ounce solution—a strength which does not cause excessive pain.

The writer has not had a sufficient number of cases of conjunctivitis due to the gonococcus to allow of a thorough investigation of the therapeutic value of the organic preparations of silver. This experience, however, leads him to think that gonorrheal ophthalmia

in infants would be best treated by irrigating the conjunctival sac every two or three hours with two pints of normal saline solution at a pressure of 1 ft. of water.

Staphylococcic and streptococcic conjunctivitis are not common. In the four cases treated by the writer the eyes treated by irrigation alone improved more rapidly than those in which a 20 per cent. solution of argyrol was instilled, though the argyrol lessened the discomfort and blepharospasm.

C. H. M.

EFFECTS OF ADRENALIN IN PROLONGED INSTILLATION. AN EXPERIMENTAL HISTOLOGIC STUDY.—VALUDE and DUCLOS (*Annales d'Oculistique*, August, 1907). Recent works have established the facts that adrenalin used for a long time may produce certain degenerative vascular lesions. Josne, by repeated injections of adrenalin in the veins of rabbits, produced aortic atheromatous lesions analogous to those caused in man by chronic intoxications.

The authors, after practicing instillations of adrenalin in the eyes of rabbits for many months, concluded that this may produce slight alterations in the walls of the arterioles of the subconjunctival tissue, limited to the superficial vessels, not affecting the capillaries of the intraocular vessels.

Clinically the prolonged use of adrenalin in the eye is harmless and need be avoided only in subjects with a marked tendency to subconjunctival hemorrhage.

G. C. H.

A REPORT OF THE COMPARATIVE ACTION OF HOMATROPIN METHYL BROMID AND HOMATROPIN BROMID AS A MYDRIATIC.—BATTEN, RAYNER D., London, Eng. (*The Ophthalmic Review*, January, 1908). The writer reports the results of a short series of experiments on the comparative action of these agents, with a view to testing the action of the former as a mydriatic, the chief points determined being (1) its rapidity as a dilator and (2) the duration of the dilatation. Homatropin methyl bromid is described by the manufacturers as "an addition compound of methylbromid and homatropin, being thus a quaternary ammonium base."

The conclusions arrived at were: 1. Homatropin methyl bromid in a 1 per cent. solution produces nearly full dilatation in times varying from 30 minutes to 1 hour. Its action in this strength is not so prompt as that of homatropin bromid, but in a 2 per cent. solution its action is fully as rapid. 2. The full dilatation with homatropin methyl bromid lasts from 2 to 4 hours, after which it passes off with far greater rapidity than is the case with homatropin bromid, the full dilatation of the latter often lasting 10 to 12 hours and then only passing off gradually, the pupil not returning

to the normal for from 36 to 48 hours; whereas, with homatropin methyl bromid the dilatation often passes off completely with a 1 per cent. solution in 5 to 9 hours, or with a 2 per cent. solution in about 16 hours. The inconvenience caused to the patient by the use of homatropin methyl bromid is, therefore, far less than that caused by homatropin bromid, and in some patients begins to pass off in less than three hours. In young patients the dilatation lasts considerably longer than in adults or elderly people. C. H. M.

THE VALUE OF ATROPIN AND HOMATROPIN CYCLOPLEGIA.—GRATIOT, H. B., Dubuque (*Iowa Medical Journal*, Nov. 15, 1907), discusses the relative merits of these two cycloplegics. He summarizes the results obtained by Jackson, Emerson, Starkey and Wood in cases submitted first to homatropin hydrobromate, then to atropin sulphate, which indicate that homatropin, properly used, is a reliable and satisfactory cycloplegic. His own results of 200 cases, which he gives in tabulated form, do not corroborate this opinion, though from his experience he believes homatropin efficient in about 75 per cent. of cases presenting for refraction. To determine when it will be efficient he tests the action of the ciliary muscles by applying to the conjunctiva $1/10000$ to $1/5000$ grain of atropin. If $1/5000$ grain of atropin is applied to the conjunctiva and relaxation of accommodation does not occur in from 15 to 60 minutes, he concludes that there is a tendency to excessive contraction of the ciliary muscles, and one of the stronger mydriatics is indicated. If the accommodation is more or less relaxed at the end of an hour, its contraction is apparently not excessive, and homatropin is used. M. D. S.

DIONIN IN THE TREATMENT OF EYE DISEASES.—LAPSLEY, R. M., Keokuk (*Iowa Medical Journal*, Nov. 15, 1907), says that dionin is a powerful analgesic and seems to increase the effect of other local remedies, as in iritis or glaucoma. In addition to its analgesic effect, generally lasting several hours, it favors the extravasation of lymph and depletes the deeper congested blood vessels, and so has a curative effect on inflammations of the eyeball. The effect on the cornea is marked also, and it stimulates active changes there, producing absorption of opacities. In the subsequent use of dionin the reaction gradually grows less and, if used frequently, in the course of a few days, it produces little or no reaction. "It is at present recommended in ulcers of the cornea, interstitial keratitis, opacities of the cornea, iritis, glaucoma, opacities in capsule following cataract operations, opacities of vitreous, intraocular hemorrhages, detachment of retina, episcleritis and in neurasthenic

eases where the eyes are complained of as hurting and feeling sore." Used in salt solution as a subconjunctival injection, it produces a very pronounced reaction. M. D. S.

THE TREATMENT OF IRITIS AND IRIDOCYCLITIS.—FUKAYA (*Klinische Therapeutische Wochenschrift*, Dec. 2, 1907). Dilatation of the pupil to its maximum and the application of a specific drug are necessary to produce a cure in severe cases of iritis or iridocyclitis.

To dilate the pupil to its maximum and to preserve its circular outline 2 to 4 per cent. of atropin, instead of the usual 1 per cent. solution, must be employed; this will prevent the formation of synechiæ.

As a specific therapeutic agent in these affections 1-4000 corrosive sublimate solution has proved to be very efficacious; this is applied to the eye by means of a cotton pledget soaked with the solution and pressed against the eyeball, but, inasmuch as the eye in these cases is very sensitive, 5 to 15 per cent. of cocain must be instilled into the eye as a preliminary measure; the sublimate solution must be of a temperature of 36° C. and rubbed into the conjunctiva of the sclera, which is followed by the instillation of a 2 to 4 per cent solution of atropin. In cases with severe pain, 6 to 8 leeches are applied. In syphilitic cases, antisyphilitic measures are indicated, and in cases with synechiæ iridectomy must be resorted to. J. G.

A PETROLEUM SOLUTION OF THE IODID OF MERCURY.—FERENTINOS, Patras, Greece (*Die Ophth. Kl.*, Sept. 20, 1907), has employed with satisfaction, in the treatment of simple catarrhal conditions of the conjunctiva, blennorrhæa, simple and serpiginous ulcers of the cornea and in eczema of the skin, a solution of the iodid of mercury in petrolatum. One gram of the iodid of mercury is added to 1,000 grams of petroleum and one part of this is added to 3 parts of liquid vaselin. The advantage of the solution is that it is strongly antiseptic without being irritating to the tissues.

W. Z.

THE THERAPEUTIC ACTION OF JEQUIRITY IN SOME CASES OF CANCER.—RAMPOLDI, R. (*Annali Di Ottalmologia*, Nos. 3-4, 1907). Two patients, aged 77 and 69 years, respectively, were cured of epithelioma of the lower lid by applications of jequirity in gelatin. The first patient showed no signs of recurrence a month after concluding treatment; the second patient was still under observation. The writer has two other cases under treatment. He advises a trial of the jequirity treatment in skin cancer. R. H. J.

NOTE ON THE TREATMENT OF THE BILE OF THE RABBIT OF SUPERFICIAL AFFECTIONS OF THE EYE CAUSED BY THE PNEUMOCOCCUS.—MORAX (*Annales d'Oculistique*, November, 1907). The bactericide properties of the rabbit's bile, in pneumococcus infection, have been demonstrated by Neufeld in experimental observations. The author has used it in several cases of pneumococcic conjunctivitis and *ulcus serpens corneæ* with hypopion, and claims that his results encourage a further trial of the remedy.

G. C. H.

THE VALUE OF SUBCONJUNCTIVAL INJECTIONS.—BALLABAN, THEODOR (*Wiener Klinische Wochenschrift*, Dec. 19, 1907). Subconjunctival injections produce certain changes in the interior of the eye which are similar to changes brought about by inflammatory processes. Under the influence of subconjunctival injections certain "protective" bodies which are present in the blood serum enter the interior of the eye in large numbers. These injections exert a beneficial influence upon chronic affections of the interior of the eye; especially so in chronic iridocyclitis, opacities of the vitreous, retinochorioiditis and hemorrhages in the vitreous. They are also of great benefit to *ulcus serpens* and keratitis parenchymatosa. Cases of detachment of the retina, caused by inflammatory processes in the chorioid, are also favorably affected by these injections.

The number of injections vary according to the severity of the disease; from twenty to twenty-five injections are in most cases necessary to produce favorable results.

J. G.

A NOTE UPON THE EFFICACY OF THE SUBCONJUNCTIVAL INJECTION.—EDWARDS, H. GREY, Bangor (*Ophthalmoscope*, November, 1907). The case of a young coal miner is reported, who sustained a corneal injury from a flying piece of coal. The eye was in such a state of ophthalmitis with corneal perforation, hypopion and corneal slough that he would have removed the eye at once had it not been for previous results obtained from injections of cyanid of mercury. The injections were tried on the case and resulted in saving the eye with useful vision. The iris was at first protruding from the corneal perforation, but finally went back into the anterior chamber without synechia.

M. B.

SUBCONJUNCTIVAL INJECTIONS IN KERATO-HYPOPION.—MAGGI, F. Pisa (*Ann. Di Oftalmologia*, Nos. 3 and 4, 1907). After washing and disinfecting the parts, the injections were made with a sterilized syringe and a boiled solution after instilling a few drops

of cocain into the conjunctival sac. Each time—every five to eight days—two injections were made of .5 c.cm., one in the superior and the other in the inferior conjunctiva a few mm. from the limbus. Bichlorid of quinin, 1 to 400, sublimate, 1 to 5000, and chlorid of sodium to 0.75 were the solutions used.

Injections of Bichlorid of Quinin.—Case 1.—Corneal ulcer with slight infiltration, hypopion of almost half of anterior chamber. process, hypopion undiminished in quantity, but more fluid. October 11, hypopion, still more fluid and diminished in quantity, ulcer small. This improvement continued and after eight days no trace of hypopion, ulcer practically healed.

Case 2.—Central corneal ulcer with infiltrated margins, hypopion of one-third anterior chamber. February 25, injection. February 27, margins of ulcer clean, fundus clearing, hypopion movable and reduced to one-half former size. March 1, ulcer in way of repair, hypopion reduced to slight streak. One day later hypopion gone, ulcer progressing towards cicatrization. March 4, patient well.

Case 3.—Large ulcer with infiltrated margins, hypopion one-third anterior chamber, slightly mobile. April 3, injection, April 4, ulcer less infiltrated, hypopion more movable. April 5, only a trace of corneal infiltration, hypopion one-half former volume and more serous in character. April 7, infiltrated margins gone. April 10, ulcer remarginated, hypopion only slight trace. Second injection. April 11, hypopion completely gone, ulcer in process of cicatrization, which continued until April 17, when the ulcer was entirely well.

Injection of Corrosive Sublimate.—Case 1.—Central corneal ulcer, with hypopion of one-quarter of anterior chamber, immobile. May 31, injection. June 1, intense edema and chemosis of lower conjunctiva, no change in hypopion. Cornea infiltrated superficially. June 2, edema of entire conjunctiva almost covering cornea. June 3, edema less. June 4, conjunctival ring covering cornea less, conjunctiva less injected, ulcer larger, hypopion denser and increased. June 6, ulcer stationary, hypopion still slightly increased. On following days hypopion slowly increased until July 10, when it occupied half of the anterior chamber. It finally had to be removed by paracentesis, after which it did not recur. The ulcer improved slowly.

Case 2.—Central infiltration of cornea, hypopion not very dense and slightly mobile, occupying one-quarter of anterior chamber. July 16, injection. July 17, intense edema of conjunctiva, cornea

more infiltrated, hypopion denser and immobile. July 18, infiltration beginning to diminish, hypopion has shaggy aspect, edema notably decreased. July 24, injection. July 25, hypopion less but compact, corneal infiltration extends to periphery. August 4, hypopion only a string, infiltration of cornea following injection almost gone. August 10, eye well.

Injection of Chlorid of Sodium.—Case 1.—Central corneal ulcer, hypopion one-half of anterior chamber, mobile. April 17, injection. April 18, ulcer large, margins infiltrated, hypopion increased. April 22, injection. April 23, eye worse. April 25, cornea wholly infiltrated, ulcer more extensive. Saemisch operation and galvanocautery. From this time hypopion not reproduced and cornea gradually improved. The writer concludes that quinin is the best injection in this disease. R. H. J.

PAINLESS SUBCONJUNCTIVAL INJECTIONS OF SALT SOLUTION.—ERB, Lugano (*Woch. f. Therap. u. Hyg. d. Aug.*, Oct. 3, 1907), has found that subconjunctival injections of from 2 to 5 per cent. solutions of salt may be painlessly made by instilling into the conjunctival sac a few drops of a 10 per cent. solution of dionin, followed in about two minutes' time by a few drops of a 4 per cent. solution of cocain. He is unable to decide whether this result is secured through the anesthesia or the edema (similar to infiltration anesthesia) produced by the dionin. W. Z.

THREE CASES OF CHRONIC HEMIFACIAL SPASM CURED BY INJECTIONS OF ALCOHOL.—NOCETI (*Archives d'Ophthalmologie*, November, 1907). In recording these cases Noceti refers to the difference, established by Charcot and others, between tics and spasms, which are usually confounded in the text-books. Tic is an untimely and exaggerated functional action and constitutes a psychomotor alteration. As regards its motor part it represents an act of defense and is a logical movement which is vitiated by its intensity, its repetition and its unreasonableness. As a result of its repetition it becomes automatic. It may be modified by a strong effort of the will. The motor alteration is provoked by an external irritation or a central excitation.

As regards the psychic or subjective part of tic, the individual affected by it always presents an imperfection of the will which may be followed by mental disturbance and end in insanity. Among those who have reached this last condition we frequently observe echolalie—a verbal phenomenon, like an echo, of sounds which the patient hears about him.

Tic is diminished by an effort of the will and attention, but these

are always accompanied by discomfort or pain, while the individual affected experiences a certain satisfaction in giving free course to it.

Spasm is an involuntary phenomenon which does not represent a functional act of life. It consists of the contraction of a fiber, a muscle or several muscles belonging to the same nervous territory. The spasm is an alteration essentially motor. The contractions are veritable convulsions, without definite end, incoördinated and resembling muscular contractions caused by electricity. Neither attention, distraction nor efforts of the will have any effect upon them. The mental state of the patients does not present the anomalies observed in the subjects of tic.

G. C. H.

TUBERCULOSIS OF THE EYE CURED WITH TUBERCULIN.—TOROK, ERVIN (*Orvosi Hetilap*, March 3, 1907). The author reports 16 cases of tubercular disease of the eye treated with tuberculin—evidently not a very rare disease. All cases were treated with tuberculin T. R. Five were perfectly cured; of these, three were cases of scleritis tuberculosa, one case of iritis, and one of tubercular conjunctivitis. Seven cases which still remain under treatment show considerable improvement. There are four cases of tuberculosis scleræ and three cases of tuberculosis conjunctivæ. In two cases the treatment failed absolutely; one of these was a case of tuberculosis conjunctivæ, and the other one of tubercular iritis.

He concludes the article by giving his opinion that tuberculin is an excellent agent in ophthalmic practice. No bad effects on other tuberculous foci in the body were observed.

J. G.

UNSUCCESSFUL TREATMENT OF SCROFULOUS EYE DISEASES WITH ANTITUBERCULOSIS SERUM (MARMOREK).—BOCK, EMIL, Laibach (*Wiener Medizinische Wochenschrift*, No. 38, 1907). Upon the enthusiastic recommendation of this serum by Ullmann (*Wiener Klin. Woch.*, No. 22, 1906) for the treatment of scrofulous eye diseases, with 7 complete cures, 5 considerable improvements out of 13 cases, Bock used it in 8 such patients whose ages ranged from 7 to 22 years, and reports the clinical histories in detail. They had been under treatment for some time with the ordinary remedies without result. In 2 cases the ocular inflammation subsided after treatment with the serum, but left opacities of the cornea like any other treatment. In the remaining 6 cases the injections (into the rectum) were of no avail. In 2 the eye affections grew much worse.

Bock abandoned the serum treatment on account of the sometimes severe general disturbances which occurred in one case:

prostration, so that the patients had to go to bed, headache, tinnitus, pallor of face, perspiration, diarrhea, anorexia. In 5 cases the temperature rose to 39° C., although Marmorek claims that his serum be antifebril.

Contrary to Ullmann, Bock found the antituberculosis serum (Marmorek) to be without effect in serofulous eye diseases.

C. Z.

GRAVE OCULAR INFECTIONS (ULCER AND HYPOPYON, POSTOPERATIVE INFECTIONS, PURULENT IRITIS) TREATED BY NON-SPECIFIC SEROTHERAPY.—DARIER (*La Clinique Ophthalmologique*, July 25, 1907). The author, at the last reunion of the French Ophthalmological Society, spoke of the important deduction in ocular therapeutics which could be made from the purely empirical application of antidiphtheritic and antitetanic sera, which in effect perhaps are similar to collargol and the "metteaux" ferment. The advantage of the serum of Roux is its nearly absolute innocuity (if not employed in too large doses) and the rapidity of its action.

Darier reports two cases which were treated by serotherapy. The first case was seen first June 22, and shortly afterwards there was an infectious ulcer with hypopyon; severe orbital pain; ulcer was 4 mm. in diameter with zone of elevated epithelium and zone of infiltrated corneal tissue; pupil completely covered by ulcer. The first injection of 9 c.cm. of the Roux serum was made in the left buttock and 1 c.c. under the conjunctiva. Locally, dionin. The day following the patient was much better, having slept well. Injection of 10 c.cm. of the serum June 24; improvement manifest; 10 c.c. of the serum injected; hypopyon less; pupil is dilated under atropin; June 26 ulcer was smaller; a second subconjunctival injection of 1 c.c. was made, producing marked swelling of the lids. Six days after the first injection the ulcer was healed.

The author states that in 25 years' experience he has never seen a case in which there was severe postoperative infection that threatened panophthalmitis, terminate in a cure with vision equaling 1/4 and without any secondary operative measure. The case was in a woman of 70, who during a cataract extraction made a sudden movement, expelling vitreous and the lens. The eye collapsed; the wound was badly coaptated and not closed on the sixth day, when intense infection followed. The lips of the wound were yellow and infiltrated; pus in anterior chamber; cornea cloudy; aqueous turbid; iris presented numerous hemorrhagic spots; upper lid and conjunctiva edematous; violent orbital pains. Darier be-

lieved the eye lost. On June 5 the first injection of antidipltheritic serum of 10 c.cm. was given; the eye being much irritated. Darier feared applying the serum subconjunctivally. Locally, oxygenated water and galvanocautery to the wound edges. June 6, the same treatment; condition stationary; June 8 three injections; there was an appreciable improvement; pains ceased; eye less irritated; 1 c.c. of serum injected subconjunctivally and 9 in the buttock. June 10, considerable improvement; the eye, except the aqueous, is clear; pupil dilated under atropin; aspect of wound much better; pus has disappeared from anterior chamber; vision allows counting fingers at 2 meters. From that time Darier injected every second day 4 c.c. of collargol. The wound was douched with permanganate. July 2 vision 1/iv, with S. + 10. A third case was reported. The explanation of the results in these cases is difficult and would seem to place some doubt as to Pasteur's law in regard to the specificity of these immunizing sera. B. E. F.

THE CALMETTE SERUM REACTION IN OPHTHALMOLOGY. VAHL, D. T., Cincinnati (*The Lancet-Clinic*, Feb. 1, 1908), reviews the literature on this subject. A 1 per cent. aqueous sterile solution of dried tuberculin ($\frac{1}{2}$ or $\frac{1}{3}$ per cent. at first, Baldwin) is placed on the conjunctiva with a medicine dropper; if the eye gets red in three to six hours after a reliable solution is properly applied, it is evidence that tuberculosis is present in the body. Several observers have made a series of tests (Baldwin, 137 cases, Stephenson, 50) and almost invariably the action was positive in tuberculous cases and negative where no history or signs of tuberculosis were present. The correctness of the test has been confirmed in scores of cases by postmortem examinations. The discomfort caused by the test is trifling, chemosis is not induced, the appearance being that of catarrhal conjunctivitis. The reaction generally disappears in from eighteen to thirty-six hours, although in a few cases a low grade of follicular conjunctivitis has persisted for several weeks. In ocular cases it has been found very useful in determining the cause of scleritis, iridocyclitis and chorioiditis. M. D. S.

THE OPIHTHALMO-TUBERCULIN DIAGNOSTIC TEST.—BALDWIN, EDWIN R., Saranac Lake, N. Y. (*The N. Y. State Journal of Medicine*, October, 1907, and *The Medical Review of Reviews*, November, 1907). The writer advocates the application of tuberculin to the eye for diagnosis according to the method of Professor Calmette, of Lille, described below, which is a modification of the subcutaneous test of von Pirquet.

One hundred and thirty-six persons have been tested by the

author and his colleagues to date, five of whom were controlled by the subcutaneous test. Of 41 tuberculous patients in all stages, 12 reacted positively, 1 was doubtful and 1 (advanced miliary) negative. Of 9 healed tuberculous persons (1 to 17 years healed), 8 reacted and 1 was doubtful. Of 26 individuals suspected because of history, symptoms or physical signs, 8 reacted positively, 4 doubtful and 14 negative. Of 57 supposedly healthy persons, 16 reacted, 8 of whom gave a family history of tuberculosis, 6 of close contact with tuberculous persons, and only 2 in which no such history was obtained. Among the 41 who did not react, 20 were farmers and guides living in the open air; most of the others were in contact with tuberculous patients. In general, the results correspond to those obtained with the subcutaneous test. Of the 6 who were thus tested, all were negative to both tests save one, who was known to have lues, and reacted to .005 c.c. tuberculin.

The figures with supposedly healthy people are not different from those obtained with the subcutaneous test, but idiosyncrasies must possibly be considered as playing some part in causing reactions until further experience and postmortem observations shall establish the limits of specificity.

Calmette (*Gazette des Hopitaux*, Aug. 8, 1907) believes that his so-called ophthalmo-reaction is of great service in the early recognition of tuberculosis in doubtful cases, and tends to establish a diagnosis with precision. Since his first paper on the subject more than a thousand observations have been made by himself and his pupils, all of which tend to show conclusively that the reaction may be demonstrated in all forms of tuberculosis, unless the patient be moribund or nearly so.

His method (*Gazette des Hopitaux*, June 25, 1907) consists of instilling a little tuberculin into the eye. In tuberculous patients there is a noticeable congestion of the palpebral conjunctiva, which becomes a vivid red, with more or less edema, in from three to five hours after instillation. The maximum reaction is attained in from six to seven hours, and disappears after 24 to 36 hours in adults and after 18 hours in children. There is no lacerimation or pain, and but trifling discomfort. In healthy persons there is no reaction.

The author employs a solution of dry tuberculin precipitated by alcohol at 95 degrees, in distilled and sterilized water. The solution has a strength of 1 per cent. and must be freshly prepared before using. The irritating effect of glycerin on the eye necessitates the use of the dry preparation as described. C. H. M.

ON THE DIAGNOSIS OF TUBERCULAR AFFECTIONS OF THE EYE BY THE CALMETTE SERUM REACTION.—STEPHENSON, SYDNEY, London (*Ophthalmoscope*, December, 1907). Prof. A. Calmette, director of the Pasteur Institute at Lille, France, has announced that tuberculosis may be diagnosed by the simple expedient of placing in one eye a single drop of a 1 per cent. aqueous solution of dried tuberculin. The ordinary tuberculin, or Koch's old preparation, must never be employed, since their contained glycerin is apt to irritate the eye and thus to simulate a true ophthalmo-reaction. One part of dry tuberculin is dissolved in 100 parts of sterilized and distilled water, and of this liquid one or two drops are placed in the eye to be tested. The eye is allowed to remain uncovered. In healthy subjects no reaction whatever follows the application. Tuberculous individuals show a local reaction, known as the ophthalmo-reaction. Thus three to six hours after the use of the tuberculin the semilunar fold and caruncle become reddened and the eye becomes congested, following closely the appearance of an acute infective conjunctivitis. Reaction attains its height in from 6 to 10 hours and disappears in from 18 to 36 hours. The discomfort is trifling. Calmette's results have been confirmed by many observers. In ophthalmology the same holds good. Stephenson has applied the test in some 40 or 50 cases in which possible tubercular involvement of the eye was feared. A positive reaction was obtained in every case where there existed clinical evidences of tubercle and in some cases where a careful examination failed to reveal any tuberculous lesion. In four cases of superficial scleritis two gave a positive reaction to the test, and one of these two showed some pulmonary signs of tuberculosis. In three cases of iridocyclitis where no general signs of tuberculosis were present the reaction was positive in each case, and in one case the tubercle bacilli were obtained from the anterior chamber. In seven cases of chorioiditis, four gave positive ophthalmo-reaction and only one gave clinical signs of tuberculosis. M. B.

THE RELATION OF THE OPHTHALMO-REACTION OF THE TUBERCULIN TEST TO TUBERCULOSIS AND TRACHOMA.—SCHIELE, Kursk (*Woch. f. Therap. u. Hyg. des Aug.*, Dec. 5, 1907), recapitulates his findings as follows: That the tuberculin test in its employment as an ophthalmic reaction in the diagnostic relation, in scrofulosis, *i. e.*, tuberculosis, as well as in follicular disease of the conjunctiva, *i. e.*, trachoma, may be employed with advantage. That to insure an errorless conclusion as to the existence of a tuberculous focus in the organism, the existence in the eye of a follicular disease of the

conjunctiva (trachoma) must be excluded. The test may not be used in the progressive stage of trachoma for fear of an exacerbation with corneal complications. The positive reaction by all forms of follicular disease of the conjunctiva, from the mildest form of so-called follicular catarrh to the severest cicatricial trachoma, confirm the common character of both as trachoma. In eczematous conjunctivitis, as well as in trachomatous conjunctivitis, the inflammatory reaction which has followed the instillation of the tuberculin may excite a fresh crop of phlyctens, as well as trachoma follicles, which may involve the entire conjunctiva. W. Z.

OPHTHALMO-REACTION IN TUBERCULOSIS.—FRANKE, E., Hamburg (*Deutsche Medizinische Wochenschrift*, 1907, No. 48, p. 1983). Calmette (Lille) found that tuberculous persons showed marked reactions upon instillations of a watery solution of tuberculin into the conjunctival sac. His observations were confirmed by Citron (Berlin), who used a simple 1 per cent. solution of tuberculin.

Franke reports his own tests on 24 patients, of whom 6 with marked tuberculous, respectively scrofulous, eye affection, one with recent chorioiditis, one with serous iritis, a child with parenchymatous keratitis, and another case after an old injury, reacted positively upon the instillations. Fourteen reacted negatively.

The effect of the instillations failed in no case in which a positive reaction was surely expected, and in some doubtful cases they gave an important diagnostic clue. The solution was dropped on the palpebral conjunctiva of one eye only, and the reaction followed after three, twelve or fifteen hours.

Citron distinguishes three stages of reaction: 1, redness of the palpebral conjunctiva and caruncle; 2, the same with redness of the ocular conjunctiva; 3, higher degrees with conjunctivitis and swelling of the lids. General disturbances or fever were never observed. Solutions of better durability than those used at present are desirable. The method may be of great diagnostic value, is easily applicable and without danger. C. Z.

OPHTHALMO-REACTION TO TUBERCULIN.—COHN, SIGISMUND (From the City Hospital am Urban, Prof. A. Fraenkel, physician in charge. *Berliner Klinische Wochenschrift*, 1907, No. 47, p. 1507) reports his experiences with ophthalmo-reaction on 310 patients. A 1 per cent. solution of old tuberculin (Höchst) without carbolic acid was instilled into the conjunctival sac. The reaction generally followed after five to six hours, or after about twenty hours and lasted from two to fourteen days. Cohn sums up: 1.

Positive reaction speaks with very great probability for tuberculosis. 2. Negative reaction does not absolutely speak against tuberculosis, since 50 per cent. of the patients affected with severe phthisis did not react. 2. Typhoid patients very frequently showed positive ophthalmic-reaction, especially during convalescence. 4. A subcutaneous injection of tuberculin, made some time after the instillation, is apt to reproduce the local reaction on the eye or to induce it, if it did not occur before. 5. A simple instillation creates a hyperesthesia of the eye in adults, free from tuberculosis, not in children, after a sufficiently long period. In tuberculous persons it generally affects also the other eye. C. Z.

ON OPHTHALMO-REACTION.—KÖHLER, F. (From the Sanitarium Holsterhausen, near Werden (Ruhe). *Deutsche Medizinische Wochenschrift*, 1907, No. 50, p. 2082). The ophthalmic-reaction was tested on 175 patients with diseased lungs, of whom 169 were clinically doubtless cases of tuberculosis, 5 not certain, 1 not tuberculous. Out of the 169 tuberculous cases (50 showed tubercle bacilli in the sputum), 83 (51 per cent.) reacted to a 1 per cent. solution of old tuberculin, 66 (41 per cent.) to a 2 per cent. solution, after the 1 per cent. had failed, 13 (8 per cent.) to a 4 per cent. solution after the 1 and 2 per cent. solutions had failed, 8 (4. per cent.) of the unquestionably tuberculous cases did not react at all. Two of the 5 doubtful cases reacted to 1 per cent. tuberculin solution, 3 to 2 per cent. The clinically non-tuberculous case reacted to 4 per cent. Hence Köhler infers that in pulmonary tuberculosis the ophthalmic-reaction is rarely negative, but it is not certain whether it may be considered as a safe, especially early, diagnostic test. After it has been ascertained that about 95 per cent. of them gave a positive reaction, its percentage must be studied on a large material of non-tuberculous individuals. C. Z.

ACCIDENTS OF THE OCULAR REACTION TO TUBERCULIN. BARBIER, M. H., Paris, (editorial in *N. Y. Med. Jour.*, Feb. 1, 1908). reports an instance of temporary danger to the eye from the instillation of tuberculin into the conjunctival sac for obtaining the reaction indicative of the presence of tuberculous disease somewhere in the body: A boy of 13 was under treatment for nephritis. A 1 per cent. solution of tuberculin was instilled into his right eye: this was followed in the same day by intense conjunctival reaction, complicated, after a few days, by keratitis with superficial ulceration. After one month the left eye became affected in like manner. After six weeks the right cornea was completely cloudy, presenting a

tion and pannus, and the ocular conjunctiva red and edematous. After three months of alternations of periods of amelioration and relapse, improvement set in, and one month later vision was satisfactory, only two eccentric spots of opacity remaining. In the left eye the lesions were similar, but less intense. The boy had had a keratitis of one month's duration eighteen months previous.

Rénon reported that in three instances out of twenty-eight trials of the tuberculin reaction he had observed accidents plainly due to the employment of the test, for the patients had never before had any trouble with the eyes. In one of his cases there was intense conjunctivitis lasting for forty-five days; in another there was slight keratitis; and in the third, twenty days after the reaction, there was extensive interstitial keratitis, with iritis, that lasted for more than three weeks, with adhesions which required the use of atropin and eserine to break them up.

C. H. M.

PASSIVE HYPEREMIA IN OPHTHALMOLOGY. — HESSE (*Wiener Medizinische Presse*, Dec. 1, 1907). A year ago the author reported a case of *ulcus corneæ serpens* treated by the suction method, with good results. Now he reports 23 similar cases treated by the same method; in addition to suction he employed atropin. The suction bells were applied twice daily for from five to ten minutes at the beginning and later for thirty minutes; there was no local sensation of pain, on the contrary the pain in the eye and the headache disappeared; the resulting scars were clear and thin.

In 3 cases of dacriocystitis the treatment by means of suction proved a failure; 2 of these showed at first slight improvement, but later the condition became worse. In these cases there was a blepharorrhea of the lacrimal sac present. In eighteen cases there was decided improvement due to the treatment by this method. J. G.

INJECTIONS OF PARAFFIN IN THE VICINITY OF THE EYE, AND USE OF SOLID PARAFFIN IN TENON'S CAPSULE AFTER ENUCLEATION. — DAVIS, A. E. (*Klinische-therapeutische Wochenschrift*, Nov. 25, 1907). The author reports two cases, which show the danger following the injection of paraffin in the vicinity of the eye. In the first case the paraffin injected at the root of the nose entered the upper eyelid, and produced ptosis; in the second case a solid paraffin ball was placed in Tenon's capsule after enucleation of the eyeball, a Frost or modified Mules' operation having been performed. After a short period, the solid paraffin mass entered from Tenon's capsule into the apex of the cavity of the eye, and compressing the optic nerve produced a sympathetic ophthalmia in the other eye.

That paraffin has an irritating effect has been proven time and again by the production of the so-called "paraffin cancer," with which laborers in the mineral oil districts are occasionally afflicted, when they come in immediate contact with paraffin.

Injections of paraffin for the purpose of improving deformities of the nose have sometimes been followed by the production of an embolus of the arteria centralis retinae, or by a thrombus of the ophthalmic vein. It is also a well-known fact that paraffin injections in other parts of the body have been followed in some cases by emboli in the lungs.

J. G.

THE SPECIFIC ACTION OF RADIUM AS A UNIQUE FORCE IN THERAPEUTICS.—ABBE, ROBERT, New York (*Medical Record*, Oct. 12, 1907). A very interesting article on the action of radium upon malignant growths, especially of the face, contains much that is important for the ophthalmologist. One of the cases narrated is that of an epithelial cancer of one-third of the upper eyelid; three five-minute séances with one cell of pure German radium bromid, 10 mgr. (working unit), permanently cured the patient in two weeks. In such cases, the writer protects the eye by thin sheet lead, shaped like a spoon handle, covered by gutta-percha tissue, and slipped under the cocaineized eyelid, between which and the radium the diseased part is compressed.

Another case was a tumor of the lower lid in a middle-aged man, growing more than a year, microscopically a small-celled sarcoma which had progressively grown in spite of careful Roentgen-ray treatment. Some little sealed tubes of radium (total strength 20 mgr. R. Br.) were laid upon the growth four times for an hour each time. In two weeks the retrograde began; in four it had undergone rapid decline, and in eight weeks it was gone. At the end of two and a half years there had been no recurrence and it was impossible to distinguish upon which eye the tumor had been situated.

C. H. M.

FRICTION IN CHRONIC AFFECTIONS OF OCULAR APPENDAGES.—LEWIS, D. H., Ottumwa (*Iowa Medical Journal*, Nov. 15, 1907). reports successful experience with the method of treatment recommended by Leekernik, in which friction by means of glass balls is employed. The balls range from 5 to 10 mm. in diameter with a glass shank of one-half to three-fourths of an inch cemented into the handle, which is made of aluminum or other light material. The author has had good results in chronic trachoma. After cleansing and cocaineizing the eye, friction is applied from one-third to two

minutes daily or on alternate days. Twenty is the average number of treatments required to effect a cure. He has found this method very satisfactory in treating indolent ulcers of the cornea, chronic blepharitis marginalis, old scars of the cornea, and chronic follicular conjunctivitis.

M. D. S.

MEDICOLEGAL.

OCULAR INFECTION: CONSTRUCTION OF ACCIDENT POLICY COVERING BLOOD POISONING SUSTAINED BY PHYSICIANS OR SURGEONS THROUGH WOUNDS.—(*Jour. A. M. A.*, Jan. 4, 1908). The United States Circuit Court of Appeals, Eighth Circuit, had, in *Fidelity and Casualty Company of New York vs. Thompson*, an action brought by the latter party on a policy of insurance "against disability . . . resulting directly, and independently of all other causes, from bodily injuries sustained through external, violent and accidental means," wherein it was declared: "This policy, subject otherwise to all its terms and conditions, covers blood poisoning sustained by physicians or surgeons resulting from septic matter introduced into the system through wounds suffered in professional operations."

There was evidence tending to show that the plaintiff, as stated in the policy, was an operating dentist; that during the life of the policy a patient, on whom he was in the act of professionally operating for affected teeth, suddenly coughed, and thereby particles of septic matter were conveyed from the patient's mouth to the conjunctiva, or mucous membrane, of the plaintiff's eye; that the septic matter infected this membrane and was thus introduced into his system, and that he was in consequence wholly disabled from practicing his profession for a period of ten weeks, and partially disabled for a succeeding period of twenty-six weeks. There was also evidence that he felt the impact of the particles on the surface of the eye, but no evidence that it produced any pain at the time, or abraded, penetrated, broke or bruised the conjunctiva, or that the septic matter was introduced into his system otherwise than through the process of infection, in like manner as if the particles had entered the nose, mouth or throat and had lodged on and infected the mucous membrane thereof.

The defendant company requested the trial court to include the following in its charge to the jury: "You are instructed that, by the terms of the plaintiff's policy of insurance, it is made to cover blood poisoning sustained by a physician or surgeon resulting from septic matter introduced into the system through wounds suffered in professional operations; but you are also instructed that there

is no evidence of the plaintiff having received any wound, and he must recover, if at all, on other provisions of the policy." But the court denied the request, and included in the charge the following definition of the word "wound," taken from the *Century Dictionary*: "In surgery, a solution of the continuity of any of the tissues of the body, involving also the skin and mucous membrane of the part, caused by some external agent, and not the result of disease. In medical jurisprudence, any lesion of the body resulting from external violence, whether accompanied or not by rupture of the skin or mucous membrane—thus differing from the meaning of the word when used in surgery."

Without doubt, the Court of Appeals says, it was essential to a right of recovery under the provision relating to blood poisoning that the septic matter should have been introduced into the system through a wound. What, then, is a wound within the meaning of this provision? No purpose would be served by stating the various meanings ascribed to the word by lexicographers, writers on medical jurisprudence, and judges, for they all recognize that one of its well-recognized meanings—that principally employed in surgery—includes an abrasion, breach or rupture of the skin or mucous membrane, whereby animal venom or virus, or some impure, poisonous or irritating matter, may gain entrance to the underlying tissues and contaminate the blood; and this, as the court thinks, is the sense in which it is employed in this provision. It is there used only in respect to physicians and surgeons when performing professional operations, and then only in respect to a bodily injury through which septic matter may be introduced into the system and result in blood poisoning. Plainly, therefore, it refers to such a wound as removes the protection given to the tissues and blood by the skin and mucous membrane and so permits of the introduction of septic matter capable of poisoning the blood; in other words, it refers to an abrasion, breach or rupture of the natural covering through which the septic matter may gain entrance.

As so employed, it does not embrace such a wound as is described in the latter portion of the definition given in the charge, and does not include the blowing against the eye of that which does not mechanically abrade, break or rupture the conjunctiva, but merely communicates to it an infectious disease by contact with its outer surface. So far as was disclosed by the evidence, the immediate mechanical effect of the particles blown into the plaintiff's eyes was not different from what it would have been if they had consisted of so much pure rain water: they did not wound it, but in-

fecting it from the exterior, operating in like manner as do some other species of infecting matter when they come in contact with unbroken skin or mucous membrane of other parts of the body. Indeed, it appeared that the pathogenic germs in what was blown into the eye were chiefly pneumococci, which, if carried into the lungs, produce pneumonia; but it would not be said in such a case that the infection of the lungs was through a wound.

The conclusion is that the instruction requested should have been given, and also that the latter part of the definition given to the word "wound" was rendered inappropriate by the other terms of the provision relating to blood poisoning. H. V. W.

MISCELLANEOUS.

MAGNETIC AND NON-MAGNETIC PROPERTIES OF IRON ALLOYS.—FRANK, MORTIMER, Chicago (*Ophthalmic Record*, November, 1907). When the percentage of manganese reaches 13 per cent. in an iron alloy, the metal becomes non-magnetic. Nickel steel is highly magnetic, but 5 per cent. of manganese added to it renders it non-magnetic. When such things as chromium and carbon are added to the alloy, the metal is rendered softer and more magnetic. Tungsten, silicon and aluminum when added in small amounts to iron increases its magnetic susceptibility. When the aluminum exceeds 17 per cent. it renders the alloys non-magnetic. M. B.

OUR DUTY TO THE SCHOOL CHILD.—BUSSEY, W. J., Sioux City (*Iowa Medical Journal*, Dec. 15, 1907), emphasizes the need of the physical examination of school children, particularly systematic examination of the eyes and ears. He says where these examinations have been made it has been found that on an average one child out of every three had some form of eye, ear or throat trouble, and gives statistics from different cities showing this. He advocates for the state of Iowa a law similar to that in Vermont, a part of which he quotes. M. D. S.

THE SACRIFICE OF THE EYES OF SCHOOL CHILDREN, THE HUMAN EYE EVOLVED FOR DISTANT VISION.—SCOTT, WALTER D. (*The Popular Science Monthly*, October, 1907), calls attention to the perversion of the natural function of the eyes, distant vision, since the conditions of civilization have made excessive near vision imperative. The adaptability of the iris and retina to different intensities of light is discussed. The pupil expands inversely as the square of the illumination, so that while a single candle power seems sufficient a ten-candle power is not too much. However, the eye can not adapt itself to the actual diversities in the intensity of

light used for reading. From experiments made by Professor Basquin of the Department of Physics of Northwestern University, with the illuminometer for a period of 22 months, taking 12:30 as the standard, it was found that in general a room which is barely adequately lighted at 12:30 will be 33 per cent. under-illuminated at 9 o'clock, and at 4 o'clock its illumination will be but 27 per cent. of the necessary amount. Also it was found that for the 22 months the illumination of the dark rooms was but 28 per cent. of that of the bright ones.

As to lighting a school room, the author says: "In our climate it is almost impossible to overlight a school room if the two following conditions are observed: (1) Never allow the direct rays of the sun to fall upon any surface within the field of vision of any pupil. (2) Avoid all glossy or shiny surfaces which reflect the light directly into the eyes of the pupils. A dead white surface is not injurious, while a darker surface may be shiny and hence injurious. For securing adequate light the following rules are important: (1) The window space should be as much as one-fifth of the total floor space, and the height of the window two-thirds of the width of the room. (2) The walls, ceiling, woodwork, furniture, etc., should be a color which reflects a large amount of well-diffused light. Perhaps the best colors for this purpose, in the order of their efficiency, are white, light yellow, light gray, light green, light blue and light pink. (3) The school room should be narrow and the windows facing an unobstructed area, so that from any seat in the room a large amount of sky is visible. (4) The windows should be provided with white Holland screens, or others of a similar sort, which obstruct the direct rays of the sun, but which, when drawn, emit into the room a maximum of diffused light. (5) There should be at hand light colored curtains which may be used to cover up all blackboards as soon as the darker parts of the room are inadequately lighted." The last is especially important in the ordinary school room having the light from one side, with five rows of desks, the last row next to the blackboard on the side opposite the windows. By the method described the light in the darkest seat has been increased as much as 50 per cent.

In the normal process of development, the individual first acquires control over the larger muscles and later over the finer ones. Modern methods of education have changed this. Instead of the normal activity of mainly the larger muscles of the child in play, the smaller are called into use in guiding the pen or following line upon line with the eyes. From his own investigations and those of

others, the writer believes that the excessive destruction of eyes begins earlier in America than formerly, and earlier than in Germany—where early instruction is largely oral—or other foreign countries, because our infants are reading more books than formerly, both in and out of school. Our improved form of education causes one-half of our children at 10 years of age—the age the Athenian boy learned his alphabet—to have defective vision. He believes that children should not be taught even the elements of reading or writing during the first year of school, but more oral instruction and physical training should be substituted.

M. D. S.

MUSCLES.

ON PARALYSIS OF THE ABDUCENS AFTER LUMBAR ANESTHESIA.—WOLFF, H., Potsdam (*Berliner Klinische Wochschr.*, 1907, No. 41, p. 1305). Upon lumbar puncture between the 3d and 4th lumbar vertebræ of a man, aged 36, instead of clear cerebrospinal fluid, apparently blood oozed, so that the intended injection of stovain for lumbar anesthesia was abandoned. A few hours later (an operation on the knee was done in chloroform-narcosis) intense pain in the back, radiating toward the shoulders and chest, set in and lasted for seven days. On the fifth day after the operation sudden paralysis of the right abducens occurred, which, after a week, commenced to diminish, and was entirely gone after eleven weeks.

Since no cerebrospinal fluid of any amount was evacuated, the paralysis could not have been due to changes of pressure. Wolff rather ascribes it to an intradural hematoma caused by vascular lesions, which give rise to toxic actions on the nucleus of the abducens or the nerve itself in its intradural course or at its exit. In this case the affection was due to the puncture and not to an injected anesthesia.

C. Z.

A CASE OF UNILATERAL MIXED NYSTAGMUS BENEFITED BY TREATMENT.—VEASEY, C. A., Philadelphia (*The Am. Jour. of the Med. Sciences*, February, 1908). The writer gives an example of this rare condition occurring in a girl of 12, whose eyes presented convergent concomitant strabismus of 15° with good vision in both eyes. After wearing spheroeylinders, correcting her refractive error, for several weeks, and employing stereoscopic exercises twice daily, the squint became less (being diminished to 5°), and there was decided improvement in the nystagmus. When the left eye was employed for fixation there were periods of nystagmic movements in the right if the child became nervous, but whenever the right eye was used as the fixing eye all movements ceased. C. H. M.

A CASE OF UNILATERAL NYSTAGMUS BENEFITED BY TREATMENT.—VERHOEFF, F. H., Boston (*Ophthalmic Record*, November, 1904). A girl of 18 gave a history of convergence of right eye at the age of 7 and nystagmus of that eye at 15. Her refraction was R. $+1.50$ \square -1.25 cyl. ax. $60^\circ = 20/xl$. L. -2.25 \square -0.37 cyl. ax. $120^\circ = 20/xv$ —. When left eye was covered the nystagmus would cease. The strabismus was corrected and nystagmus continued. She was given a plus lens over left to blurr vision and finally this lens was smeared with vaselin. The right eye would then fix and the nystagmus cease. After this was done for five weeks the vaselin was discontinued, as it was found not needed. When she read the nystagmus reappeared, because she then fixed with left eye regardless of the additional plus lens. M. B.

ASSOCIATED MOVEMENTS OF THE UPPER EYELID AND JAW.—STEPHENSON, SYDNEY, London (*Ophthalmoscope*, January, 1908). At the age of 9 months the child sustained a depressed fracture of the skull. The left has always been the smaller eye and since the accident the right upper lid twitches when the child eats. Synchronous with movements of the jaw the right upper lid jumps up and down. The usually accepted explanation is given, that the levator of the lid ordinarily supplied by the third nerve nucleus receives in the cases an additional supply from the fifth nerve nucleus, which also innervated the muscles of mastication. N. B. Harman regards the "jaw-winking" movement as an atavistic anomaly in which there is an association of the jaw muscles with the migrated spiracle muscles. M. B.

A CASE OF FLEETING PARALYSIS OF SOME OCULAR MUSCLES.—WYLER, JESSE S., Cincinnati, Ohio (*Arch. Ophth.*, January, 1908, xxxvii, 16), reports a case of paralysis of the ocular muscles occurring in a man aged 29. Patient had a similar attack two years previously that lasted six months, when the right external rectus was involved. Wyler found an insufficiency of the superior oblique and the internal rectus of the left eye. Diplopia was present. Treatment: Aspirin three grams daily and galvanic electricity. Recovery in three weeks.

The author calls attention to the obscure etiologic element, there being nothing in the history of the case or physical findings to indicate the cause of the paralysis. He reviews the literature of reported cases that bear some similarity to his, but states that he is unable to find a case exactly similar. He mentions the possibility of its being a prodromal symptom of early multiple sclerosis.

W. R. M.

PROGRESSIVE FAMILY, EXTERNAL, NUCLEAR OPHTHALMOPLÉGIA.—PASETTI, G., and SALANI, C., Florence (*Annali Di Ottalmologia*, Nos. 3 and 4, 1907). Among the different types of nuclear paralysis of the extrinsic muscles of the eyes, this form is the rarest and most characteristic. It treats of a paralysis which strikes with different intensities all the extrinsic muscles of both eyes, leaving intact the intrinsic muscle. It shows itself in various members of the same family through different generations. It makes its appearance about the age of 40 years and follows a regular course either through intensity of the lesion or through the order with which it affects single muscles. In the literature three typical cases have been reported. The first was that described by Dutil in 1892. It treated of a patient in Charcot's clinic, 57 years old, who at the age of 45 years, was taken with paralytic ptosis of both eyes. The patient had no other trouble. Seven members of his family on the maternal side were affected the same way at about 50 years of age. The second series of cases was described by Gourfein in 1896; seven members of the same family were affected with complete ophthalmoplegia. The third series was recorded in 1900 by Beaumont, who observed twelve cases of ophthalmoplegia externa divided among four generations of the same family, which otherwise was perfectly healthy. The disease comes only in adult life and progresses slowly until all the external muscles are paralyzed. Ptosis is one of the earliest symptoms. In the authors' series ten members of the same family, distributed through three generations, were attacked. Only four of these patients were not seen, but a clear history of the cases was gotten. The ages of the six examined were 72, 66, 61, 52, 43 and 31, respectively. All these patients presented well-marked ptosis. They could not open their eyes, but had to raise the lid with the finger. The writers made the diagnosis from the fact that the lesion was bilateral, from the regular succession with which each single muscle was affected, the progressiveness, the freedom of the intrinsic muscles from disease, the absence of pain, the absence of every other lesion of peripheral nerves. R. H. J.

NERVOUS SYSTEM.

A CASE OF CONGENITAL OPHTHALMOPLÉGIA INTERIOR.—LEVIN-SOHN, GEORGE, Berlin (*Klinische Monatsblätter fuer Augenheilkunde*, 1907, xlv, ii, p. 391). Both pupils of a man, aged 17, showed maximal mydriasis and did not contract upon light or convergence. One drop of a 1 per cent. solution of eserin had no effect. Only after six instillations within 1¼ hours the right pupil measured 3.5

mm., the left 3 mm. This was of great importance, since Levinsohn had observed in all other cases of ophthalmoplegia interior marked and intense miosis after using one drop of a 1 per cent. solution of eserine. Hence he had concluded that in all cases of ophthalmoplegia interior the terminal neuron of the sphincter iridis, which starts from the ciliary ganglion, must have remained intact, and the cause of the lesion can not be attributed, as Marina does, to the ciliary ganglion. The incomplete reaction to eserine in this case suggests either an anomaly of the sphincter or the ciliary muscle or the neuron supplying these muscles. Since all acquired pupillary disturbances readily respond to eserine, Levinsohn thinks a congenital anomaly probable in this case. This is strengthened by the history of the case, as the parents had observed an anomaly of the eyes when the boy was 4 years old, and when he was 8 years old, a physician had asked whether drops had been instilled into the eyes of the boy. There were no other symptoms of a cerebral affection. Analogously to the conditions in congenital palsies of the exterior ocular muscles, Levinsohn assumes an aplasia of the nuclei supplying the interior muscles with consequent atrophy of the nerves and muscles.

C. Z.

REMARKS ON A CASE OF RECURRENT PALSY OF THE THIRD NERVE.—FINLAY, C. E., Havana, Cuba (*Arch. Ophth.*, January, 1908, xxxvii, 1), reports a case of recurrent paralysis of the third nerve in a patient who had been subject to periodical attacks of severe headache, in the form of a right hemicrania, accompanied by vomiting and malaise. In the last attack, before seen by the author, there appeared symptoms of paralysis of the third nerve, which disappeared at the end of three weeks. When seen by Finlay there was a total and complete right ophthalmoplegia. At the end of a few days there was an improvement, which was followed by a relapse; this was followed by an improvement again until all paralysis had disappeared except that of the iris and ciliary muscle. Treatment consisted of potassium bromid, potassium iodid and strychnin. The author reviews the literature and divides the course of the disease into four stages. First stage: Periodical attacks of hemicrania accompanied by malaise, vomiting, etc. Lasts a few hours to a few days and not accompanied by visual aura. Second stage: Pain ceases and beginning signs of paralysis with return to normal condition. Third stage: Certain amount of paralysis persists in one or more muscles after the attack. Fourth stage: Paralysis becomes permanent and attacks of pain recur at intervals.

The author divides the attack proper into two periods: (a) The

period of pain. Onset sudden, always on the same side of the head, ends suddenly by vomiting, and followed by (b) the period of paralysis. May last several days or several months.

Third nerve usually involved. Etiology uncertain. Treatment symptomatic and palliative. Bibliography is added. W. R. M.

OPERATIONS.

THE OPERATION OF GRAFTING THE RABBIT'S CORNEA ON THE HUMAN EYE.—VALK, FRANCIS (*Am. Journ. of Surgery*, January, 1908). The writer has performed this operation three times, his first two cases in 1889, his third recently. The first case derived no improvement from the operation; in the second example, "the graft not only lived, but became only partially opaque, so that there was a decided improvement in the visual power; and the last time I saw the patient she was able to move about in her apartment and do some simple housework;" in the third case the entire thickness of the cornea was removed by trephine, and then there was found a dense mass of pigment and inflammatory products filling the pupillary space, making the prognosis very doubtful.

He considers a suitable case for the operation one in which there is leucoma without complications in the posterior surface of the cornea, or in the iris, but he believes this condition to be rare; the unfavorable state of Descemet's membrane is revealed only as the various steps in the operation proceed, but we are justified in undertaking the measure in these examples in the hope that a favorable base for the graft will be found. In all three cases the graft lived but became more or less opaque. C. H. M.

ENUCLEATION OR EVISCERATION?—HENDERSON, F. L., St. Louis (*Am. Jour. of Ophthalmology*, January 1908).—The writer gives the following conclusions in a paper discussing the relative merits of these two operations: 1. Evisceration is a simpler operation under what we may call normal conditions. It is decidedly easier in the presence of panophthalmitis or a collapsed globe. 2. It leaves a more normal mucous membrane, a fuller orbit for a time at least and probably for life. The fuller orbit helps to diminish the depth of the upper sulcus when a prothesis is worn and also probably adds to the excursions of the artificial eye. 3. There is no evidence to prove that it is not as safe a prophylaxis against sympathetic ophthalmia as enucleation. 4. It affords greater security against orbital infection, sinus thrombosis and meningitis. 5. Protection against the recurrence of malignant neoplasms requires a thorough removal of all contiguous tissue. The amount

of tissue to be removed depends upon the nature, size and location of the growth. These surgical principles obtain when such developments appear on or in the eye. They usually demand enucleation of the ball and sometimes exenteration of the entire orbit.

C. H. M.

A NEW METHOD OF ENUCLEATION OF EYEBALL UNDER LOCAL ANESTHESIA.—ROBIN, E. A., New Orleans, La. (*New Orleans Med. and Surg. Jour.*, December, 1907, lx, 454), advocates the use of local anesthesia for enucleation. He used it in thirty-four cases, injecting deeply, along each rectus muscle, ten drops of a mixture containing ten drops of a 4 per cent. solution of cocain, ten drops of adrenalin chlorid (1-1000) and twenty drops of normal salt solution. Ten drops are injected about the optic nerve before severing. Total amount of cocain injected $2\frac{5}{8}$ to $1\frac{1}{2}$ grain. The author reports absence of pain during operation, and considers it safer than general anesthesia.

W. R. M.

ANTIGLAUCOMATOUS IRIDECTOMIES.—HOTH (*Annales d'Oculistique*, May, 1907).—In the fifty years that have passed since Graefe discovered the hypotoning effect of iridectomy and applied it to the treatment of glaucoma, the results have been brilliant in the acute form of the disease, but in chronic glaucoma the failures have been numerous. Sclerotomy and sympathectomy have been practically pretty generally abandoned, and iridectomy still remains the intervention of choice. Myotic treatment is important, but generally sooner or later loses its efficacy.

The author has not found the final results of his ordinary iridectomies for chronic glaucoma very satisfactory, but has noticed that it was decidedly better in certain cases in which there were irregularities in the cicatrization of the wound. In these cases there was a slight conjunctival edema at one or both extremities of the incision. The cause of this "infiltrating cicatrix" is a minute incarceration of the iris, the included fragment of iris forming a veritable fistula in the cicatrix. In all the cases in which conjunctival edema was present the tension remained normal and the state of vision satisfactory for years. Several cases are reported in illustration.

In this way the author was led to combine with iridectomy an incarceration of a fragment of iris in the angles of the wound.

The only objection to this procedure is the risk of infection, which he thinks is reduced to a minimum by covering the cicatrix with a conjunctival flap. This is accomplished by puncturing the conjunctiva five or ten mm. beyond the point where the knife enters

the limbus and pushing it forward to the seat of the incision. The columns of the coloboma are drawn into the wound with fine iris forceps, or the segment of iris is prolapsed and the central portion only is cut away, leaving the edges incarcerated. G. C. H.

SIMPLE ANTERIOR SCLEROTOMY.—BETTREMEUX (*La Clinique Ophthalmologique*, Aug. 25 and Sept. 10, 1904). The work of Lagrange has produced a revival of the question of sclerotomy being regarded as a measure of supplementing scleral incisions in certain ocular affections with hypertension. In simple chronic glaucoma, Lagrange recommends sclerotomy combined with iridectomy, the latter operation having had for more than a half century a sufficiently bad reputation. Graefe considered it contraindicated when the limit of the visual field was close to the point of fixation, iridectomy having for effect the immediate diminution of central vision; Gama-Pinto has given a similar opinion.

The last numbers of the *Archives of Ophthalmology* reproduce statistics of the treatment of glaucoma after cases operated by Koster. With reference to simple glaucoma the late results of these cases are divided into four classes: one class gives the successes, which are divided into two series, according to those in which there was an amelioration or a visual *statu quo*, and the other in which the results were less favorable with slow visual diminution of vision.

In giving the coefficient 2 to those cases clearly of good or bad result and 1 to those cases having an intermediate result, which would seem logical, one arrives at the conclusion that sclerotomy renders five or six more chances of a good result than iridectomy. And Bettremieux naively adds: "La glaucome simple n'aime pas l'iridectomie."

In a certain number of cases sclerectomy is indicated, while iridectomy is dangerous. The author recommends an operation which includes the excision at one or more points of the circumference of the cornea, only the external layer of the sclera. A conjunctival flap which can be dissected either from corneal edge or towards the cornea; if the latter, the conjunctival strip is simply held in place by a suture. The sclerotic being uncovered with a needle slightly curved at its extremity, as recommended by Parinaud for posterior sclerotomy, Bettremieux traverses the layers of the sclera, which he then excises with a straight Graefe knife. The author has experimented on rabbits with the anterior simple sclerectomy without the least unfavorable result, neither at the time of operation nor afterwards. After a few weeks the operated eye

can only be distinguished by a depression at the level of the scleral excision, and later there is the picture of the sclera having been thinned at that point. This operation does not preclude its repetition at the four cardinal points of the cornea. Parinaud has proved that after posterior sclerotomy the least possible reaction persists indefinitely, and that a black spot is visible, which is, of course, the chorioid. Parinaud considered posterior sclerotomy of service in chronic glaucoma, but he does not employ it in the malignant form to avoid enucleation. The difference in effect of iridectomy, whether it is done for an elevated glaucomatous tension or a slight hypertension, results from the manner of coaptation of the lips of the scleral wound; in either case the incision is united by cicatricial tissue, and this occurs in all the scleral layers if the tension is little above normal; on the contrary, a marked hypertension raises the edges of the wound, the external layers not being in contact, the intermediate space is filled by fine trabeculae of dark color, which may not, according to de Wecker, form a cystoid scar in order to produce power. Simple sclerectomy, which removes the external layers of the sclera; results in the lowering of the constriction upon the eye, which, according to Stellwag, is the aim of sclerotomy, creating, as it should, a zone of filtration. The author states he has never observed the least ectasia follow anterior simple sclerectomy. According to Lagrange, the filtrating cicatrix in regular form is characterized habitually by a notable elevation of the conjunctiva. De Wecker, on the contrary, denies considering this cystoid cicatrix as the type of a filtrating scar and claims that it results in a vicious distension of interstitial trabecular tissue with insufficient filtration. Simple sclerectomy gives, in a more or less pronounced degree, the true filtrating cicatrix, according to de Wecker; the term filtrating zone is more appropriate.

The author has done the operation of simple anterior sclerectomy in two cases of chronic glaucoma. The first case had lost the vision of the left eye; the visual field of right eye was much reduced; vision allowed counting fingers at $1\frac{1}{2}$ meters in the external portion of the field. Some days after the sclerectomy on the right eye central vision was regained sufficiently to enable the patient to go about alone. After a few weeks vision was 1/3. Anterior sclerectomy was also done on the left eye to relieve pain, and pain did not recur. In a second patient sclerectomy had not arrested the progressing limitation of the visual field; vision of each eye was 1/6. Simple anterior sclerectomy on each eye produced slight amelioration of sight and of tonus. The author believes that

it will require many cases and longer time for observation to be able to determine definitely as to the value of simple anterior sclerectomy; he wishes now to draw attention to the operation, which he considers harmless and the most rational which we are able to bring against chronic simple glaucoma and perhaps other ocular conditions in which there is hypertension, absolute or relative. Bettremieux gives very briefly a report of two cases as examples of conditions in which he believes the operation should be done. The first was one of hemorrhagic glaucoma, chemosis, pericorneal injection and acute pain. T. + 2. Iridectomy was considered dangerous. Anterior sclerectomy near the upper border of the cornea and at the lower corneal border a sclerotomy. In the second case, in which sight had been obliterated, the operation was done for relief of the acute pain.

B. E. F.

A METHOD OF EXTRACTING THE THICKENED AND OPAQUE CAPSULE SOMETIMES LEFT AFTER THE ABSORPTION OF TRAUMATIC OR AFTER THE EXTRACTION OF OTHER COMPLICATED CATARACTS IN WHICH THE PUPIL IS USUALLY DILATED AND DISPLACED, AND A DENSE WHITE MEMBRANE FILLS THE PUPILLARY AREA.—GREENE, D. W., Dayton, Ohio (*Ohio State Med. Jour.*, November, 1907), gives his method of extracting an opaque and thickened lens capsule by means of a right angle very sharp needle. The point of the needle is passed through the periphery of the cornea from above and then forced into the capsular membrane. By gently rotating the needle the capsule is torn from its zonular attachment and wound about the point of the needle. It is then extracted through a corneal incision, on the temporal side, with a hook. The author reports satisfactory results, but states that it is open to all the objections of a traction operation and should be applied to selected cases.

W. R. M.

CUTTING OF BANDS OF THE VITREOUS IN TRAUMATIC DETACHMENT OF THE RETINA.—ZIMMERMANN, W., Goerlitz (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, August-September, 1907, p. 192). Two months after extracting of a piece of iron from the inferior temporal portion of the vitreous, very fine bands were seen coursing from the scar to the medial wall of the globe. Four weeks later a flat detachment of the retina at the inner scar was noticed (in atropin mydriasis) from which dense bands in the vitreous crossed, close behind the lens, to the nasal wall, with corresponding lack of the visual field.

Sliding the conjunctiva, Zimmermann introduced, under control with the ophthalmoscope, von Graefe's knife through the upper

portion of the globe downwards between posterior pole of the lens and the bands and cut these in a long stroke from forward backwards. A gap in the bands was distinctly seen at the first change of dressing and the detachment of the retina had become flatter.

Under internal use of iodid of potassium the vitreous had perfectly cleared up, and the retina was reattached, with $V. = 5/xv$ and normal visual field. The optic disc was a little veiled, but there certainly was no affection of the nerve. Small remnants of the foot-points of the bands could be seen at the inner wall. After the retina was liberated of the traction by the vitreous, cicatrization with the chorioid and resorption of exudation took place. Without this operation the eye would have been lost. C. Z.

OPTICS.

PROTECTION OF THE EYES AGAINST ULTRAVIOLET RAYS OF GLARING SOURCES OF LIGHT BY A NEW, ALMOST COLORLESS KIND OF GLASS: PRELIMINARY COMMUNICATION. — VOGT, ALFRED, Aarau (*Archiv fuer Augenheilkunde*, lix, p. 48). After extended preliminary investigations at the instance of Prof. C. Mellinger, of Basal, Vogt examined a glass, colorless in thin layers, which shows the maximum of absorption for ultraviolet rays obtainable. It is a flint glass, manufactured by Schott & Genossen, of Jena, as type 0.198, and is destined to serve as material for spectacles and lamp chimneys for protection against the deleterious influences of glaring light. C. Z.

DOUBLING THE READING POWER IN AMBLYOPIA BY THE CROSSED-CYLINDER "READER."—GOULD, GEORGE M., Philadelphia (*American Medicine*, December, 1907), recommends for amblyopic patients, when their deficient acuteness is not too great, a rectangular crossed-cylinder lens about 3x4 inches. He says this magnifies uniformly the entire line of type and without distortion. It is most helpful to those having vision of from 20/1 to 10 cc. These lenses are usually made with the handle inserted in the center of the longer side, at right angles to it, but some are being made with handle extending obliquely downward from a lower corner. The frame enclosing the lens and the handle are dull black. Plans are under way to place the lens in a stationary holder adjusted to any position chosen, so that the hands may both be free.

M. J. S.

SOME PRISMATIC EFFECTS OF LENSES.—PERCIVAL, ARCHIBALD S., Newcastle Upon-Tyne (*Ophthalmoscope*, January, 1908). When lenses are prescribed which are unequal in strength for the

two eyes the fact should be considered that when reading through their lower portion an unequal prism effect is produced. This action causes the effect of a prism base up or down over one eye. For presbyopic patients a proper decentering of the segments in bifocal lenses will overcome the defect, or if two pairs of lenses are prescribed the pair for reading should be properly decentered. He offers no remedy in young patients except two pairs of glasses, one for distance, and one for near, another pair in which appropriate decentering has been done. M. B.

A FAR-SEEING EYE: FRENCH INVENTION ENABLES ONE TO WITNESS SCENES ENACTED AT A LONG DISTANCE.—(*Milwaukee Journal*, Jan. 10, 1908). An electric eye has been perfected by a French inventor, Constantin Senlecq, which bridges space with as great facility as does either the telephone or the telegraph, and with its aid one will be able to see over the mountains and the plains just as readily as he can now look across the street.

M. Senlecq calls his apparatus a telectroscope. As in the telephone, there is a transmitter and a receiver, and in each of these there is a revolving disc, that in the former being so arranged that it will catch the impressions of the movements which go on before it, while the disc in the latter is so constructed that as it receives the impulses from the transmitter it can throw them in enlarged fashion upon a screen.

Suppose you were sitting in the room with a telectroscopic receiver before you and that the transmitter stood in a room out in San Francisco where your brother and his family were passing the afternoon or the evening.

Through a short focus lens in the transmitter, a reduced picture of the scene in the room would be carried to the disc whirling around not less than ten times each second. In an incredibly short time the whole picture would be taken up by the disc, and after the full scene was there the revolving disc would begin to show the movements that were made by those in the group.

If we wondered why this was and examined one of the transmitting discs we would find that it was composed of two sheets of copper with a sheet of mica as thin as paper separating them. The sheet of copper which faces the lens and the mica sheet are perforated and arranged spirally so that only one of the holes is opposite the scene at a time and so that the image to be absorbed is always visited by some one of the perforations as the disc whirls around.

The holes are filled with a composition known as selenium and

this serves to establish the electrical connection over which the impulses are carried to make the picture on the receiver. According to the illumination of the object which comes within the range of disc-perforation, so the selenium plug is affected. If it is very bright the effect upon the composition is intense and so down through the scale to darkness. If the plug is but slightly affected the impulse carried to the receiver is slight and it is through the graduation of the current thus produced that the lights and shadows are worked into the picture upon the receiver far away. In other words, by catching up the light parts of the picture, the darks and all of the others in between, the transmitter assembles the parts of the complete scene.

H. V. W.

OPTIC NERVE.

PATHOLOGICAL PIGMENT FORMATION AT THE OPTIC DISC.—SÄTTLER, C. H. (From the clinic of Prof. C. Hess in the University of Würzburg, *Archiv fuer Augenheilkunde* 58, p. 126). A girl, aged 15, sustained in her third year an injury of the temporal orbital margin and was blind in this eye as long as she could remember. When 10 years old she was operated on for divergent squint of the eye. The cornea showed 4.50 astigmatism according to the rule. The temporal third of the optic disc was covered by thick black pigment, at the nasal portion the pigmentation was slight and consisted of single fine granules which were more densely arranged at the borders of two vessels in the lower part. The center of the disc was white, free from pigment, and had the same level as the fundus. The lamina cribrosa could not be discerned. The margin of the disc was partly covered by pigment. A narrow, faint yellowish red halo surrounded the disc. The vessels, especially the arteries, were thinner than those of the other eye and partly had light streaks on the sides. Some continued as thin white lines to the periphery. The vessels at the disc were partially covered by pigment. The left eye was normal.

Similar cases of E. von Jaeger, Liebreich, Knapp, Hirschberg, Leber and Deutschmann are quoted, in which the pigmentation was ascribed to a hemorrhage.

Sattler considers it probable that in his case the pigment was a remnant of a hemorrhage occurring at the accident, but of what kind the injury to the optic nerve or globe had been can only be conjectured. A primary hemorrhage in the optic sheath was not likely, as Liebrecht found in his numerous anatomical investigations on the relations of cranial fractures to the eye that hemorrhages with following pigmentation of the optic disc originate

from the blood vessels of the disc and surrounding retina and not from the optic sheath. But not every hemorrhage of the fundus is converted into pigment. The blood on the disc may be entirely absorbed without leaving a trace of pigment. The immigration of pigment into the retina after cutting the optic nerve and the ciliary vessels is most likely due to circulatory disturbances of the retina as shown by the experiments of Wagenmann. The melanotic discoloration of the optic disc in malaria cachexia is, according to Poncet, caused by pigmented giant cells in the capillaries of the disc.

C. Z.

ABNORMAL PIGMENTATION OF THE OPTIC DISC.—FÉJÉR, J., Budapest (*Archiv fuer Augenheilkunde*, 58, p. 290). The left eye of an intelligent girl, aged 8, showed intense convergent strabismus, V. = 1, xxx, V. of right eye with —1.00 5/xv. No signs of congenital lues. The left optic disc presented a striking black pigmentation. It was framed by a black trapezoid the sides of which were wider than one-fourth of the disc. The vessels were covered by it, except two thicker ones, an upper and a lower, which ran over it. Outward and downward from the disc atrophic foci were seen, and pigment was strewn about all over the fundus. The ophthalmoscope revealed myopia —13. No positive explanation of the pigmentation is given, but the author attributes it to a probable scattering of germs of chorioidal pigment.

C. Z.

PRESSURE-EXCAVATION AND ATROPHY OF THE OPTIC NERVE.—SCHMIDT-RIMPLER, H., Halle a. S. (*Archiv fuer Augenheilkunde*, lix, p. 1). Glaucoma consists in increased tension and affection of the optic nerve, no matter whether this is due only to pressure or whether both have a common cause and are independent upon another. There is no glaucoma simplex without, at least temporary, hypertrophy. Therefore the cases, originally called by von Graefe "amblyopia with excavation of the optic disc," are simply affections of the optic nerve, no glaucoma. Clinical and anatomical observations have shown that the excavation in these cases may be as steep as a glaucomatous excavation and the vessels may, like in glaucoma, present a marked marginal bend. In a case of Schmidt's, which is described in detail, the lamina cribrosa was, at the autopsy, displaced backward 0.4 mm. and the condition of the optic nerves and tracts and the pia revealed a descending atrophy. Similar cases of Stellwag von Carion, Schnabel, Gama Pinto, Elschnig and Purtscher are quoted from literature.

Schmidt repudiates the assumption of Schnabel that the glaucomatous excavation be due to a specific and histologically peculiar

process in the tissues of the optic disc and nerve, the "cavernous atrophy," uninfluenced by the increased intraocular pressure. Clinically there is no pressure excavation absolutely typical of glaucoma. Exceptional cases have been observed with steep excavations, in which vision remained permanently intact without glaucomatous symptoms. One seen by Schmidt and another one by Schweigger are mentioned. The history of a case shows that these excavations may be congenital.

The diagnostic difficulties of these cases may be increased by the additional occurrence of increase of tension in cases of atrophy of the optic nerve. Schmidt distinguishes two forms of these affections: 1, in connection with ocular optic atrophy from choriorretinitis; 2, with genuine descending atrophy. Four such cases are reported.

These observations show that the therapeutic failures with regard to the preservation of sight in glaucoma simplex may occasionally be due to primary atrophy of the optic nerve.

As to the healing effect of our operations in glaucoma simplex, one becomes, according to the experience of Schmidt, more reserved the longer the patients remain under observation. Schmidt does not dissuade from operation, which in a number of cases at least retards blindness. In general he prefers sclerotomy to iridectomy, and reports in detail two cases with preservation of sight for many years after the operation.

C. Z.

SOME FORMS OF ATROPHY AND OPTIC NEURITIS OF RARE OCCURRENCE AND DIFFICULT TO RECOGNIZE.—DIETEL, A., Padova (*Annali Di Ottalmologia*, Nos. 6, 7 and 8, 1907).

Amblyopia from Ankylostomiasis.—Sept. 25, 1906. V. M., 28 years old, came into the clinic complaining of decided diminution of vision in both eyes. The patient asserted that the disturbance of sight had begun July 20 of the same year, had persisted unchanged for about a week and had then gradually grown worse for three or four consecutive days. The vision had diminished progressively. The patient was in robust health; he had had no venereal disease. One month before his trouble began he suffered pain in the frontal region, which lasted only a few days. Objective examination showed in both eyes pupils moderately dilated, reacting well to light, directly and consensually, and to convergence. The dioptric media were clear. The papillæ were pale, more so in the temporal than in the nasal half, where they had a rosy aspect, but not as pronounced as in health. The borders of the papillæ were well defined and the retinal vessels presented nothing abnor-

mal. There were no signs of hemorrhage in the retina. In O. D. V. was equal to counting fingers at 1.5 meters; in O. S. V. was equal to counting fingers at 0.75 meters. With O. D. the patient distinguished all colors; with O. S. blue and yellow were recognized with difficulty. General examination revealed nothing abnormal in the nervous system or in the internal organs. Examination of the feces showed a few eggs of *anchylostoma duodenalis*. The administration of thymol caused the evacuation of 14 *anchylostoma* of the species *Dubini*. V. began to improve at once and soon reached in O. D. 3/1, in O. S. counting fingers at 2 meters.

R. H. J.

EDEMATOUS OPTIC NEURITIS IN THE INTRACRANIAL COMPLICATIONS OF INFECTIOUS DISEASES OF THE EAR.—MORAX (*Annales d'Oculistique*, May, 1907), reports a case of extradural abscess and thrombosis of the lateral sinus resulting from chronic purulent otitis in which there was pronounced edematous optic neuritis (choked disc). He thinks that such cases furnish an argument in favor of the theory of intracranial edema as a cause of choked disc.

After a long discussion of the subject, the author concludes that the edematous optic neuritis which sometimes appears, either with or without functional ocular symptoms, in the intracranial complications of chronic purulent otitis, is not an extension of the infection to the meninges, but that it probably has the same pathogeny as the choked disc occurring in intracranial tumors, and indicates a hydrocephalic condition.

Its presence does not appear to affect the prognosis, which is much influenced by prompt and radical treatment. G. C. H.

ORBIT.

SPONTANEOUS HEALING OF TRAUMATIC PULSATING EXOPHTHALMOS.—PINCUS, F., Coeln (*Zeitschr. fuer Augenheilkunde*, xviii, July, 1907, p. 33). A miner, aged 31, fell on an iron plate, with the right side of his head, from a height of 14 meters. He was unconscious for several hours, pulse and respirations were retarded, and there were considerable hemorrhages from nose, left ear and into the right orbit. On opening the suffused lids after a few days, he noticed that his right eye was totally blind. On the eleventh day there was ptosis, paralysis of the external rectus and weakness of all other ocular muscles, dirty grayish discoloration of the temporal half of the disc, arteries narrow, veins more filled, right facial paralysis, perforation of left *membrana tympani*, left eye perfectly normal. About a month later the disc was pale, the

paralysis of abducens unchanged, the other ocular muscles normal, and the facial paralysis had almost entirely subsided. The general condition was good, but the patient suffered from headaches. These increased within the following three weeks, and he noticed buzzing and throbbing in head and ears. The left eyeball was protruding inwards and downwards, and the external rectus was paralyzed. The retinal veins were swollen and tortuous.

Vision, visual field and accommodation were normal. Pulsation of the protruding eye could not be seen nor felt until it was pressed back into the orbit. On auscultation a continuous noise, interrupted by loud systolic blowing and *bruit de piaulement* was heard at the temple and other places of the head. These noises, however, were much more intense over the right eye and temple, while not the least pulsation was noticeable on this eye. Compression of the left carotid had no influence upon the noises, while they stopped immediately upon compression of the right carotid, the changes at the retinal veins remaining unaltered. An operation was refused.

Ten and one-half years later the patient presented himself again, with the report that the noises had entirely ceased a week ago, when, after two days of violent headaches, he had compressed the right carotid.

Pincus assumed a fracture of the cranial base, involving the apex of the right orbit, with laceration of the optic nerve in the optic canal, extending to the left and backwards of the petrous bone. Undoubtedly an arterio-venous aneurism had formed by rupture of the internal carotid within the cavernous sinus.

The most interesting, almost unique, feature was the, as it were, crossed condition, i. e., left-sided pulsating exophthalmus which depended upon the right internal carotid and could be removed by compression of the right carotid. For this Pincus gives the following explanation: The patient noticed the noises very soon after recovering consciousness, so that the communication between artery and vein must have occurred immediately after the accident, but, as the exophthalmos did not develop until two months afterwards, the transmission to the opposite orbit after gradual expansion of the necessary blood paths. Since the veins, leaving the right orbit through the superior orbital fissure, had been torn by the fracture at the apex of the orbit, thus closing the right orbit towards the sinus, the arterial pressure upon the venous blood in the sinus was not propagated to the right orbit, but through the circular sinus of Ridley and the left cavernous sinus to the left orbit, so that the picture of pulsating exophthalmus of the left eye was created.

The second interesting point in this case was the spontaneous healing, corresponding to similar observations of Sattler and others. It apparently was due to thrombosis in the orbital veins and the cavernous sinus, which very likely had also caused the violent headaches preceding the healing.

In spite of this favorable course, the case does not speak in favor of conservative treatment of pulsating exophthalmus, especially as the danger of ligation of the carotid in this affection is very slight.

C. Z.

UNILATERAL EXOPHTHALMOS IN A NEW-BORN INFANT.—PECK, W. H., Chicago (*Annals of Ophthalm.*, July, 1907). A child born under normal conditions developed a proptosis of one eye which gradually protruded for more than a quarter of an inch and then gradually receded until the eye was in its normal position when it was 6 weeks old. The author thinks the proptosis was caused by vascular obstruction, which was finally remedied by the establishment of collateral circulation.

M. B.

TRAUMATIC ANEURISM OF THE LEFT ORBIT; LIGATION OF THE COMMON CAROTID; GREAT IMPROVEMENT.—MOUTINKO (*Archives d'Ophthalmologie*, August, 1907) reports a case of traumatic pulsating exophthalmos in which ligation of the common carotid was followed by entire relief from pain and pulsation and considerable diminution of the bruit and exophthalmos.

G. C. H.

PARASITES.

A RARE CASE OF ECHINOCOCCUS OF THE OPTIC NERVE.—PAPAIOANNON, THEODORE, PROF., Athens (*Deutsche Medizinische Wochenschrift*, 1907, No. 40, p. 1635). A boy, aged 12, had, when 6 years old, very intense pain in his right eye, with redness and gradual failure of vision. After a month blindness was complete and exophthalmos had developed. The eye was displaced upward and outward. At the inner side of the orbit a hard tumor was felt, covered by conjunctiva. After osteoplastic operation according to Kroenlein the eyeball and the greatest part of the sac of the tumor, which proved to be a cyst, were removed. It ruptured and evacuated fluid, clear as water, and six echinococci of the size of a pea and one of the size of a grape. The rest of the sac had to be left behind, on account of its adhesions to the lower orbital wall. The enlarged eyeball was opaque, limber. A very short distance behind it the optic nerve was occupied by a mother cyst of a vertical diameter of 3 cm., a sagittal diameter of 1.3. As the anatomical exami-

nation revealed, the embryos of echinococci had reached the optic nerve by the central retinal artery. The author says that literature so far does not contain a similar case. C. Z.

PATHOLOGY.

CONCERNING THE PATHOLOGICO-ANATOMY AND THE PATHOGENESIS OF KERATOCONUS. SALZMANN (*Graefes Arch.*, LVII, H. 1, November, 1907) has made a microscopical study of a keratoconus in an eye removed from a 20-year-old female. During life it appeared as a light gray hazy keratoconus, fixed, semidilated pupil, normal iris, hypermature cataract. Tn. Eye blind. The eye was of normal size and form, excepting the cornea. The apex of the cone was below and to the nasal side. It was surrounded by a shallow groove which divided the central ectasia from the less affected part of the cornea. The actual ectasia extended over three-sevenths of a corneal meridian. The apex showed a faint flecked blue-gray opacification; otherwise the cornea was clear. The ectasia occupied the optical zone and from the periphery of the zone to the apex the thickness of the cornea gradually diminished and here equaled about one-quarter of the usual thickness. The periphery was not truly ectasic, but was elevated in the sense of being a part of the conical formation.

A second type has been described in which a gradual diminution of the corneal thickness occurs from the apex to the periphery of the cornea in the form of a hyperboloid curve. The two forms are not sharply defined, because of the approach of the intermediate types to either of the extremes.

The first impression given by an examination of a section through the ectasia is that of simple tissue defect. A consideration of the finer details brings forward two possibilities: either the fundamental structural elements (the elementary corneal layers) are enlarged and thinned and stretched over the entire membrane or they have retained their normal dimensions and only changed their position in relation to one another. That the surface is enlarged and the thickness of the entire cornea lessened. In the first instance the number of lamellæ in the thickness of the cornea is normal, but the individual lamellæ are thinned. In the second instance there are fewer lamellæ in the thickness of the cornea, but the individual lamellæ are of normal thickness. The cleavage of the corneal stroma is increased in the area of the apex of the cone. The union of the lamella must be weakened if extensive clefts can form, and this would favor shifting of the lamellæ in a superficial

parallel direction. The lamellæ of the apex are visibly thinner than at the periphery, and it is in the lamellar groups resulting from the cleavage that the progressive thinning in the vicinity of the apex can be perceived. Only the changes in the anterior point with certainty to a spreading of the structural elements and a consequent dehiscence or rupture.

Bowman's membrane was but slightly thinned and only onto the one side. It contained rents at the apex which were occupied by a lamellated connective tissue with fixed cells—a reparative process.

Descemet's membrane contained gaping holes not corresponding exactly with the thinnest part of the cone, but with the neighborhood of the apex of the cone. The author is convinced that all of the above changes are the result of the ectasia. The endothelium showed a granular change of the protoplasm, but these changes were general and can not be considered a factor in the production of the cone.

The author believes that extra-uterine phases of development are responsible for the origin of the cone. The gross changes in the normal cornea cease with the end of the first year. The connective tissue material in general shows a tendency to an increase and thickening of the fibrillar intercellular substance and to a diminution of the cells, and it would be strange if the cornea departed from this rule. It is to be presumed that with the growth of the remaining portions of the eye and body in general the demand for firmness and durability on the part of the cornea is increased and that under normal conditions it adapts itself in an equalizing measure. Should, however, the corneal center lag behind in any phase of the extra-uterine development, it is conceivable that this malrelation would gradually increase so that finally, without any extraneous conditions, a vicious circle leading to conical cornea would be initiated. Whether this originated in a thinning of the corneal center or in a lessened resistance can not be determined in a fully developed keratoconus. The anatomical findings are simply those of ectasia. The condition can not be entirely a condition of disturbance of growth nor a formative defect. But, on the other hand, a slight degree of primary tissue defect as a starting point can not be excluded. It is to be recalled that the center of the cornea is thinner than the periphery and that this is due to a fewer number of lamellæ, and in meridional section it is quite plainly seen how the lamellæ, when followed from the periphery to the center, one after the other, are wedged against Descemet's membrane. Perhaps keratoconus differs only in degree from the normal formation of the cornea.

While nothing definitely can be stated as to the mode of origin, it would be more likely to be due to a disturbance of development at the corneal center, if deviations from the normal were present in other parts of the external coats of the eye.

As the question of etiology stands to-day, it seems to be analogous to the etiology of posterior staphyloma. This is also absent at the time of birth and develops in childhood or at the age of puberty. Here, also, we are obliged to assume the presence of a congenital defect. It also has the course of an ectasia. Both are localized to a pole of the eyeball and lead to the same functional disturbances. It seems proper to include them in a special group of ectasiæ tunicæ fibrosæ oculi. The characteristics of this group are that they develop without preceding disease, inflammation or increase in tension in eyes which were previously normal in form and function. They develop in the polar region, whereas secondary ectasias usually affect other regions.

W. Z.

A CONTRIBUTION TO THE PATHOLOGICAL ANATOMY OF DIPHTHERITIC CONJUNCTIVITIS.—IGERSHEIMER, Heidelberg (*Graefe's Arch.*, lxvii. 1, November, 1907), has made an anatomical study in two cases, having the clinical picture of diphtheritic conjunctivitis. In the first case the bacilli were found in the secretion. The post-mortem diagnosis was diphtheria. In the second case the post-mortem diagnosis was bronchopneumonia with laryngo-tracheal catarrh. The ocular findings corresponded in the main in the two cases. The stadium of membranous formation was past anatomically in both cases when the study was made. The vessels of the necrotic tissue were nearly all thrombosed. The formation of the thrombus differed in the two cases. In one it was composed principally of degenerated red blood cells; while in the second case there were degenerated red cell, hyalin, fibrin and bacterial thrombi. These conditions explain the high degree of anemia present clinically in diphtheritic conjunctivitis. The Meibomian glands showed necrotic changes, and in the absence of micro-organisms these must be explained by the entrance of toxins. In neither case were the bacilli of diphtheria found within the tissues. Large numbers of staphylococci were found in the superficial layers of the conjunctiva.

W. Z.

PHYSIOLOGY.

CONTRIBUTION TO THE STUDY OF THE COMMISSURE OF GÜDDEN.—ST. BERNHEIMER, Innsbruck (*Graefe's Arch.*, lxvii. H. 1, November, 1907), has had the opportunity to study the relations of the commissure of Gúdden in the brain of a rat with bilateral an-

ophthalmos. He found that the bulk of the commissure was in relation with the geniculate bodies; a lesser number of the fibers separated from the major bundle and radiated into the reticulate layer of the optic thalamus after surrounding and penetrating the peduncles, only a very few isolated fibers reaching the region of the corpora quadrigemina by both ways.

Sufficient material is not at hand to determine definitely by the various methods (Golgi, Nissl and others) the origin and termination of these fibers, but it appears to the author that, at least, fibers of this commissure end and have their origin in the geniculate bodies. Through these the internal geniculate bodies were connected by transverse fibers in both directions. The physiological significance of these commissural fibers coursing in both directions is not settled. It is certain, however, that they have nothing to do with vision. Perhaps in spite of the fact that these fibers, having connection with the chiasm and optic thalamus and having no anatomical relations with the visual fibers, upon grounds of their anatomical arrangement, their direction, their origin and termination may be considered as a kind of auditory commissure. Then it would appear to be no mere chance that the mouse, rat and mole have a strongly developed inferior commissure. W. Z.

THE INTERVAL OF TIME WHICH TAKES PLACE WITH PERIODIC RETINAL IRRITATION BY LIGHT OR ELECTRIC FUSION CURRENT.—CORDS, Coln (*Graefe's Arch.*, lxvii, H. 1, November, 1907), concludes from his experimental investigations that:

1. The fusing interval was not demonstrably different for the two forms of stimulation.

2. The fusing interval with electric stimulus in change from darkness to light is influenced by the intensity of the latter and it increases also with the strength of the electrical irritation.

3. In stimulation of the eye with the shortest possible light stimulus the fusing interval, as with the electric stimulus, was first induced when the stimuli reached 160 to the second, which indicates a differentiation faculty of 0.006 second.

4. A dependence of the fusion interval upon adaptation was not demonstrated.

5. Pressure blindness acts upon the sensibility excited by electrical irritation, as well as upon that excited by light. W. Z.

INVESTIGATION ON THE EXTENT OF THE PUPILLOMOTOR AREA OF THE RETINA AND RECEIVING ORGANS.—HESS, C., Würzburg (*Archiv. fuer Augenheilkunde*, lviii, p. 182). So far the whole retina was supposed to contain pupillomotor receiving apparatus.

Hess found, in studying the incident literature, that not one of the authors had answered this question undisputably. The chief fault of the former investigations was that the influence of diffuse light, in illuminating a certain area of the retina, was neglected. An isolated illumination of a central or excentric portion of the retina is impossible, and the question whether the pupillary reaction observed on throwing light into an eye, which had been kept dark, be due to excitation of a central portion by diffuse light or of peripheral parts by regularly refracted and diffuse light, could thus not be answered. Hess, therefore, devised perfectly novel methods by making the fovea diffuse light constant in all tests. This was effected by moving the exciting light in a circle around the fixation point, or center, on his new instrument, the pupil perimeter. The importance of the diffuse light was shown by the observation that the diascleral light alone in the methods of illumination ordinarily used is sufficient to elicit pupillary contraction. Another experiment, described in detail, emphatically demonstrated how small changes in the intensity of the diffuse light may produce pupillary reactions under conditions which completely excluded the pupillomotor action of the exciting light itself. In all experiments with his pupil perimeter the pupillary reaction was the same whether the exciting light impinged on the blind spot or on neighboring light perceiving points of the retina. The size of the pupil remained unaltered when the exciting light passed from the illuminated to the dark half of the retina or *vice versa*. Hess concludes that the pupillomotor portion of the retina has at the highest a radius of 3 mm. or less around the retinal center. His investigations made it very doubtful whether a hemiopic pupillary reaction exists or not. Hess soon expects an answer to this by subsequent examinations with these methods of a sufficient number of such cases in which a hemiopic reaction seemed to be proven by tests so far in use.

With regard to the anatomic base of these interesting physiological phenomena, it has not been determined in which element of the retina the pupillomotor receiving organs are to be placed, as some supposed them in the light perceiving elements, others in the interior granules, the parareticular cells. Hess refers to his researches on the color sense of day birds, in which he showed that the primary excitation of perception of light and color is situated in the exterior portions of the cones. His recent investigations proved that the exterior portions of the cones of day birds represent not only the optic, but also the pupillomotor receiving apparatus. It is

a pleasure to read this admirable essay of Hess, describing his methods, which are models of ingeniously devised, clear and simple experimentation, and we urgently recommend it to our readers.

C. Z.

EXPERIMENTAL INVESTIGATIONS ON THE PUPILLARY CENTERS OF BACH-MEYER IN THE MEDULLA OBLONGATA.—TRENDelenBURG, W., First Assistant at the Physiologic Institute, and BUMKE, O., First Assistant at the Psychiatric Clinic, Freiburg i. B. (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, ii, 1907, p. 353). In 1898 Bach concluded, from his decapitation experiments, that cutting of the spinal cord is without influence upon the motility of the pupils, if a piece of cervical cord is left in connection with the medulla oblongata. He placed the reflex center of the pupils into the uppermost portions of the cervical medulla, and thought his view supported by the pathological changes of the posterior fascicles of the cervical cord, observed by G. Wolff, and brought in relation to reflex iridoplegia in paresis. Ruge showed the fallacy of this assumption by the experimental proof of a cerebral pupillary center. Then Bach again took up these experiments with H. Meyer and modified his theory by surmising a center of pupillary dilatation, most probably a checking center, in the medulla oblongata, besides other centers of pupillary dilatation in the cerebrospinal system. Since quite a number of arguments have been raised from various sides against these results, Trendelenburg and Bumke made controlling experiments on cats, 16 of which are reported in detail. In order to keep the animals alive for longer observation, only one-half of the cervical medulla was cut. This was done under Zeiss' loupe of an eightfold magnifying power. The light reflex of the pupils was tested with an electric lamp of constant strength.

In summarizing the results, the authors found that considerable loss of blood causes mydriasis. Ether narcosis alone may produce reflex iridoplegia, as well in mydriasis as in miosis, while exposure of the medulla does not cause anything of the kind. Therefore, the pupillary disturbances, observed by Bach and Meyer in etherized cats, can have no bearing upon the exposure of the medulla. The mydriasis observed by cutting the medulla is due to nothing but an intense sensitive excitation, just like that after squeezing the tail or faradization of the legs. In all experiments with half-sided sections, the pupil of the corresponding side became miotic, after it had sometimes been wider than the other for several minutes or longer after the operation. The authors attribute this to a probable irritation of those paths, the interruption of which may damage

the pupillo-dilatating forces, i. e., relative miosis. Sections through lower portions of the medulla had the same effect, perhaps in consequence of injuring descending sympathetic fibers. After cutting the spinal end of the rhomboid fossa or exposure of the rhomboid fossa, miosis or sluggish reaction to light never occurred. The authors thus showed that there is no causal connection between certain lesions of the rhomboid fossa and certain pupillary symptoms. Consequently the only reason so far known for the assumption that the medulla oblongata has a specific bearing on the innervation of the pupils falls to the ground. The recent anatomopathological researches of Bumke on the relations of lesions of the cervical medulla to reflex iridoplegia yielded the same negative results: the material substrates of isolated iridoplegia do not lie in the cervical medulla. It is, therefore, without prospect to search further in the medulla for pupillary centers and the anatomopathologic causes of reflex iridoplegia. The methods and details of the interesting experiments must be studied in the original.

C. Z.

PHOTOTROPISM IN MAN.—REDDINGIUS, R. A. (*Tydschr. v. Gen.*, Dec. 8, 1906), states that the undifferentiated protoplasm of the most simple organisms uses light as a stimulus for chemical changes which spread in the protoplasm and produce active motion. In higher animals, as in men, the protoplasm remains the essential element, but it is much differentiated, its highest development is the retinal element, nerve fiber and cell, and muscle fiber.

As the just fertilized human egg does not much differ from unicellular organisms, we may expect that the same relation as to changes in orientation of the different parts of the protoplasm may be transferred to the different retinal elements in men. This may partly explain the nativistic views of Hering (1868), who ascribes to different retinal elements different "Raumwerthe," by which he means certain elements of consciousness. According to newer views, these elements of consciousness are to be considered as representations of motions, as psychic equivalents of, or, rather, as the same as the impulses for motion of our body in a certain direction.

For the interpretation of the doings of man it is unimportant if these impulses be conscious or not. We must suppose a connection between certain retinal elements and motions in distinct directions, which can not be different in men from that of animal or plant. This leads us to speak of phototropism in men.

The difference between higher and lower animals, as regards their susceptibility for light-stimuli lies, for a large part, in the

localization of their elements, which undergo change through the light excitation. While in the lower animals the body surface everywhere or in a certain number of places is sensitive to light, we have with men only the retinal elements. The light which affects the retinal foveæ is the light which travels in the direction of forward motion.

When light falls in a direction not coinciding with the forward motion on the body of certain insects, then the affected elements of these animals turn in the direction of the light rays; so do the non-foveal retinal elements of men. When at the end, through this turning, the light falls in the direction of the forward-directed eyes, then these appear to move the animal forward; the same is the case in some circumstances of the foveal retinal elements in men. Therefore, phototropic turning and phototropic forward motion will be distinguished.

One of the necessary properties of the higher animals is their possession of a brake. Probably the blood distribution in the brain is the way by which these brakes are put. Only in one, and then always narrow-limited, cortical region the maximum of blood supply can be reached, which will directly be followed by attention, which is nothing else than the coming to the front (consciousness) of the processes dependent upon the maximal blood supply.

The brake on the motor reactions of the incited foveæ is nearly always present, and of the other retinal elements in a certain sense is generally present. People gathered together in twilight will direct their eyes to some artificial light. And as men have only one fovea, birds have two regions for clear sight, they all show phototropic turning of the eyeballs. But a turning of the head or of the upper part of the body helps to make this rotation of the eyeballs as small as possible, we prefer to speak of a phototropic turning of the foveæ. Reddingius imagines that stimulation of a peripherally situated retinal element makes its own direction combination of cells and paths functionate. This direction combination is divided in mutually independent subcombinations, i. e., one for both foveæ, one for an arm, one for a leg, one for a hand, one for some finger, one for the head with the eyes remaining fixed on the object, etc. If a subcombination has transformed its function in motion of the concerning part of the body, this depends upon putting the brake on the efferent paths or not. Sometimes not a single motion follows, as all paths to the muscles are stopped. Then our attention can be directed to the point in space where the object is, which was the origin of the direction combination. Here we could speak of a

direction motion of the attention, which is caused not through the large muscles, but still through material changes, perhaps muscles in the wall of the cerebral blood vessels. Besides a few rare motions the ordinary movements of our limbs are phototropic motions.

It is not probable that the connection between the motions of the limbs and the direction motions of the foveæ is an invariable one. As the growth of the orbits, of the limbs, of the muscles during life will not be perfectly harmonious, and still the grown-up man seizes what he sees as well as he did when a child, it must be improbable that the connection formed in the first year of life should be unchangeable. This can also be easily demonstrated by putting a strong prism before one eye. The experimenter bringing a prism before one eye, while closing the other, sees all objects displaced to the right and misses his hold to the right at first, which he corrects after some exercising. These changes could be made stabile by bandaging up the limb. The change is in the motor-cerebral zone of that limb, but not in the judgment of the direction of the eyes (versus Helmholtz). With the prism we see the object, which is in A, to the right of it in B. The author thinks that the motion of the hand from B to A can be explained in the following way: The representation of an object seen at a distinct place is already an association of ideas, formed by the direction motion of the attention for the place of the object. This association has again further sequences, further associations or, finally, motor reactions. We must here accept that two such associations have simultaneous effect, which effect consists in a new secondary association. The first as regards the hand, the second the object. The secondary association must be regarded as the observation of the difference of both places and of the direction of that difference. An all-seeing observer would have a substantial motor impulse, acting only on the part of the body which is in a non-stopped condition and thus on the pointing hand. This to us unknown motor reaction to an association, a part of which is formed by the effect of retinal images from our limbs, has evidently the character of an innervation correcting the direction motions of the limbs.

The direction motions of the hand are not as exact in the dark as they appear in daylight, because our finer "under-the-guidance-of-the-eye-performed" motions are not pure phototropic direction motions, but are corrected by the correcting innervations (see prism experiment).

What extent these corrections can take is well known from the experiment of Stratton, using an instrument, which acted as a tele-

stone, so that which was to the right he saw to the left and reversely. He used it for eight days; after removal he saw everything the wrong way during some hours and made according wrong motions. Reddingius believes the foregoing to have removed the value of the empirical theory of Helmholtz. E. E. B.

RESTRICTION OF FORWARD MOTIONS AND OF THE SIZE OF IMAGES.
—REDDINGIUS, R. A. (*Thydschr. v. Gen.*, Dec. 15, 1906). When one throws small different sized pieces of meat to a dog we see that even when only a sham throw is made the dog follows with his head the sham direction, while his ears and his gaze express the activity of certain association. This association would be for men the agreeable expectation of taste—sensations with positive-sense tone. If again it is thrown, then the head is moved in the right direction and at the right moment, neither too early nor late, the mouth is opened and the meat caught. As the pieces were of different size, it follows that not a certain size of the retinal images, but that a certain distance of the falling object, naturally with some other equally remaining circumstances, was the cause of the opening of the mouth. Continuing these experiments and taking a big piece of meat one sees with the sham motions that a different association is formed. Reddingius thinks (he did not try it) that by throwing this big piece the dog would not have made the snapping motion, but would have retired. But the reactions with the sham motions show that the dog has different reactions in proportion as the thrown object makes a larger or smaller retinal image. And still the retinal image of the big piece is at the distance of two meters smaller than that of some of the caught pieces, when they had neared the mouth at one decimeter and the mouth was opened. This shows that the reaction to certain size of the retinal image, for the dog, is modified by the distance at which the object causing the retinal image exists.

We found here three circumstances influencing the reactions of the dog: 1. The distance of the visible object. 2. The size of the retinal image. 3. The combination of the distance of the object and the size of its retinal image. The nature of the third cannot be explained for the dog, but can for man. We do not mistake a coin at a third of a meter or at three meters; therefore it follows that for our observation, in proportion the extent of the retinal image becomes larger by approach, a concomitant decreasing influence, emanating from the diminution of the distance of the object, is active. Physiologically the approach of an object has a limiting influence on the reaction, which its retinal image, as regards

its size, follows, and this limiting influence keeps equal pace with the increasing size of the retinal image following the approach.

No. 2 is easily explained, as a large retinal image affects more retinal elements than a small one and therefore can produce another reaction. As to No. 1, the distance can work as excitation or by producing dispersion circles, or as it produces images on dissimilar retinal elements in both eyes.

Reddingius found that with monocular vision the forward motion of the hand is restrained for the nearly right distance by the influence of the distance of the object. This restraining influence is limited to half a meter before the eye. At distances not exceeding half a meter the effect of the size of the image is limited by the distance of the object for monocular vision. The muscles of accommodation also are affected by the distance of the object.

At the first moment it is difficult to understand how dispersion circles can act as optical distance excitation, for focussing for too small a distance must have the same effect as for too large a distance, as the sensitive retinal elements are irritated in the same way by both. But with all accommodating animals we see a difference of reaction according to a distinct or indistinct retinal image. In general an indistinct retinal image acts so that accommodation follows. According to Reddingius' view we do not accommodate because we see indistinctly, but because an indistinct retinal image acts the impulse for accommodation is brought about.

A distinct retinal image does not provoke to accommodation: also an indistinct image, which does not become less indistinct after the accommodation impulse, does not provoke another accommodation impulse. Myopes without correction do not accommodate for distant vision, and emmetropes find that when they direct their gaze from one object to another which is more distant, but the observer does not know it without blinking, they see that object first indistinctly, and that this indistinct retinal image does not cause more indistinct seeing, nor more accommodation innervation. This experiment can only be done monocularly, as with binocular vision the second object directly would cause a relative distance perception.

That dispersion circles are optical distance excitations for men, at least when the objects are situated between the punctum proximum of accommodation and half a meter, can be demonstrated by paralyzing one eye with homatropin; the mistakes in touching made at distances between 50 and 25 cm. are important and always in the direction that one touches much too near. *Beckes, H. (1915).*

cles for accommodation are parietic the indistinct retinal images produce more frequent and stronger accommodation impulses than a normal eye, which sees at these distances. This more frequent and stronger action of the indistinct retinal image causes at the same time limitation of the forward motion of the hand. Therefore, the hand touches at too small a distance. But also the limitation of the action of the size of the retinal image must thereby have increased. This gives us the explanation of the centuries-known micropsia after instillation of belladonna. Aubert (1876) found that known objects, which we see smaller, are projected not at a smaller, but at a larger distance. We find that if the smaller seen object is within arm's reach and we try to touch it with a quick motion that then the hand appears not at a too large, but at a too small distance, demonstrating that at these small distances the motions of our limbs directed at these seen objects do not become modified by our judgment of their distance. We are not forced at all to look for a secondary cause for this diminution of the size; there is no objection to attribute it to the direct action of the indistinct retinal images, which also limit the forward motions of our hands. Only the conscious projection at too large a distance is secondary and is brought about by associations.

It follows that the same retinal images on dissimilar retinal elements in both eyes are optical distance excitations from the fact that in binocular vision increased limitation of the forward motion of our limbs and increased limitation of the action of the size of the image are visible, when on leaving the necessary accommodation impulse normal we increase artificially the convergence impulse with adduction prisms. Changing the prisms in abduction, we will notice macropsia if the objects are at a distance not exceeding three meters. Here the accommodation impulse is normal, but is smaller for convergence, which produces a limitation of the forward motions of the limbs and a limitation of the action of the size of the image, which is smaller than in normal circumstances. The macropsia is not seen at a distance over three meters. In normal circumstances a limitation of the action of the size of the images through heteronymous double-images is present at three meters with binocular vision, while monocularly this limitation through indistinct retinal images is present a half a meter (Reddingius). This difference can be explained by the quicker tempo and finer shading, wherewith the distance stimulus acts in binocular vision.

E. E. B.

FUSION AND FIXATION.—REDDINGIUS, R. A. (*Tydschr. v. Gen.*, Dec. 22, 1906), considering the possibility of increased and decreased convergence with the same amount of accommodation, accepts two organs, one the "first fusion organ," which must receive its stimulation from out the retinae, namely, from those light stimuli in both eyes, which, when they are perceived under abnormal circumstances, we call heteronymous diplopia, while the "second fusion organ" must be connected with what we call homonymous double-images. The first fusion organ is brought into play when we put prisms with the bases out before the eyes and keep up single vision. With accommodation convergence is combined; covering one eye and accommodating, say, at 30 cm., we find an unnecessary convergence motion, which must be performed as the accommodation through the stimulus of dispersion circles, which Reddingius calls the "organ for dispersion circles," and which is different from the accommodation center, which is really only the beginning of the accommodation nerve.

Accommodating for an object at 30 cm., we can bring abducting (base in) prisms before the eyes not only until the visual lines are parallel, but even further until a divergence of about 4° occurs. Then double images appear, which can not more be brought together. Here we have the maximum of action of the second fusion organ. But looking at an object at large that is without accommodation, then the maximum of action of the second fusion organ appears to be far less, as then the eyes diverge more than about 4° . Reddingius thinks the action of the second fusion organ to be in the first place putting a brake on the convergence innervation, in the second place giving a weak divergence innervation. The antagonism is not between the interni and externi recti muscles (Nagel), but between the two combinations of brain cells, called the first and second fusion organs.

With lenses of ten diopters one can see an object in the median line at one decimeter without accommodation with either eye separately, a convergence of 10 meter angles appears with binocular vision, the object is seen singly but indistinctly on account of dispersion circles caused by a superfluous and interfering accommodation innervation. This can not depend on the organ for dispersion circles, as none were present, but depend on the same stimulus that arouses the first fusion organ. Reddingius thinks we have here truly "retarded" innervation; as the convergence and accommodation centers lay close to each other, there is no objection in accept-

ing the theorem that with a strong irritation a part impinges on the more forwardly situated accommodation center.

Monocular instillation of atropin produces micropsia for that eye, which shows that the action of the organ for dispersion circles has a limiting influence on our estimation of the size of objects. The action of the first fusion organ has a similar limiting influence, as vision through adducting prisms produces micropsia.

If one looks during half an hour only at distant objects through adducting prisms which are sufficiently strong that one just can see binocularly, then one will have, after removal of the prisms, seeing with one eye, a strong latent convergent strabismus of the other eye or an esophoria, which will be so much the stronger as he sees nearer, and at the same time micropsia is present for nearby vision with one eye; binocularly all is seen of normal size at every distance. Koster, wearing such prisms each of 15° during two hours, looking through them for near and far, acquired a manifest strabismus of 7° to 10° and found the same for other emmetropes. Seeing through the prisms, the organ for dispersion circles remained inactive, while the first fusion organ was unusually strongly active; the consequence was a removal of the ordinary hindrances in the paths going out from that organ, through which the convergence innervation, later present with the monocular vision, became too effective. The micropsia demonstrates that the brakes must mostly exist in the brain. The removal of the hindrance must have occurred in the first fusion organ or in both paths emanating from it, which determines our estimation of size, and the other on the convergence center. With monocular vision, in the second part of the experiment, only the organ for dispersion circles and not the first fusion organ is brought into action through the direct influence of the light. As we observe an increased action of this last organ, we must conclude that the first fusion organ is active with monocular vision, indirectly, the stronger as the accommodation is stronger; that the organ for dispersion circles receives its convergence and its limitation of the size determination of the objects only through the first fusion organ, and that, therefore, this organ lies in the way of stimuli coming from the organ for dispersion circles. The connective path between the phylogenetic and ontogenetic older organ for dispersion circles and the first fusion organ has the useful result that a corresponding convergence appears always with accommodation, through which in daily life changes occurring between monocular and binocular vision may take place without hindrance.

That we have an organization for fusion in vertical direction Hering demonstrated in 1868. Placing a prism with the angle upward brings that eye upward (for instance the right) and the other downward. The strongest prism before one eye is twice as strong as each prism for each eye, which points to a coupled innervation, which will be called the innervation of the third and fourth (innervation of the right eye downward and at the same time of the left eye upward) fusion organ (1898). It is easy to demonstrate that many, especially those with a marked asymmetry of the face, constantly use this third and fourth fusion organ. The impulses for the third and fourth fusion organ remain unconscious.

Seeing with abducting prisms, as strong as possible, in the distance for some time after removal produces a weak latent divergent strabismus for all distances with monocular vision, which shows that with normal monocular vision a weak divergence innervation is present. The second fusion organ also influences the size determination of the objects. Through the strongest abducting prisms we see objects at 2 to 3 meters distance larger than usual. The second fusion organ acts, therefore, as a brake for the organ for dispersion circles or the first fusion organ as regards size determination of objects.

The divergence innervation, as stated with normal monocular vision, does not depend on the organ for dispersion circles, nor even upon the second fusion organ. It must originate in another sort of light action, which can not be else than excitation of light in one or both eyes.

Light reaching one or both eyes is the cause of fixation, of the minimal contraction of all extrinsic eye muscles. All external ocular muscles are connected with the representation of the fixation mechanism. As the muscles that cause divergence pertain hereto and as they are those which are brought into contraction through the second fusion organ, we will also speak of a "second fixation innervation." As the position of absolute rest of the eye muscles is divergence and as we find parallel axes with binocular vision and even with monocular vision at a great distance, we must conclude that the falling-in of light produces a convergent action which causes the parallel position of the visual axes. This is only possible by an innervation, which is the same as the one of the first fusion organ, and may be called the "first fixation innervation." This must not only cause equilibrium with the present second fixation innervation, but it must have so much preponderancy over this that the eyes, under the antagonistic action of both, take the position with parallel visual axes.

It is clear that a fixation in the vertical meridian must exist just as well as in the horizontal. Otherwise we would all show, at least with monocular vision, vertical nystagmus. It could be produced by a weak innervation, which directs both eyes upward, and an antagonistic impulse, which directs both eyes downward. But this is not acceptable from the presence of the fourth and third fusion organ, and we must suppose that the fusion innervation can be used for fixation innervation.

We can demonstrate not only that the third and fourth fixation innervations exist, but that they are the same innervations as the third and fourth fusion innervations. A prism worn half an hour with the angle upward before the right eye, which is so strong that binocular vision is just possible, exercises the third fusion organ. After removal the Maddox rod shows that with monocular vision the visual axis of the right eye is too high, and that with binocular vision a stronger prism with the angle upward before the right eye can be overcome and that the prism with the angle downward before the right eye which can be readily overcome is weaker than before using. Using now the stronger prism with the angle upward before the right eye, then with the monocular vision after another half-hour, the right eye not only is too high after removal of the prism, but also with binocular vision a manifest vertical strabismus is present. Nearby vision had no particular influence, which shows that the organ for dispersion circles has no influence here. The stimulation can not be else than simple falling-in of light in one or both eyes, from which follows that we have here to deal with an abnormally grown third fixation innervation, which must be the same as the much exercised innervation, which goes out from the third fusion organ. Analogically we must accept a fourth fixation innervation, which innervation at the same time is used by the fourth fusion organ for fusion.

Many cases of nystagmus are apparently caused by defects in the fixation mechanism. No nystagmus originates in the blind-born or in those who became blind in a very early age, because the directing innervations can not develop. Poor vision from childhood produces nystagmus, because the directing innervations can develop, but a better vision would have been necessary for developing the fixation innervations. If in later life the vision is increased by medical help, the nystagmus does not disappear entirely, because the fixation innervations are only formed in youth; it is the same with the development of binocular vision.

E. E. B.

REFRACTION AND ACCOMMODATION.

A FURTHER STUDY OF THE SO-CALLED HOROPTER. MAKING OCULAR ROTATION EASY OF UNDERSTANDING.—SAVAGE, G. C., Nashville, Tenn. (*Ophthalmic Record*, December, 1907). The visual axis is the true antero-posterior or optical axis, the posterior pole being the central point of the macula. All lines of vision intersect the visual axis at the center of retinal curvature, which is the center of rotation, and, like the visual axis, are radii of retinal curvature prolonged; the cone at the posterior pole of one eye corresponds with the cone at the posterior pole of the other eye, for the reason that these have a common brain-cell connection in one cuneus; all other corresponding retinal points are either rods or cones with a common brain-cell connection, either in one or the other cuneus; these corresponding points compose the corresponding retinal meridians, and these corresponding points are related, each to its own fovea, by degrees of arc and not by millimeters. Helmholtz, in his chapter on "Rotations of the Eyes," made three fundamental errors: first, his error in locating the poles; second, his error in constructing the visual axis, and, third, his error of conception of the primary isogonal circle (horopter), without which there could be no correct understanding of either monocular or binocular rotations. The spherical concavity of the two retinas and the law of direction create the mathematical circles of possible binocular single vision. These circles are innumerable and must be divided into two classes. There is the primary isogonal circle, which lies in a plane with the horizontal retinal meridians, and then come an infinite number of secondary circles, each of which has its own plane. All these circles have the same radii and they are all bisected by the extended median plane of the head. These circles pass through the two eyes, bisecting their centers of rotation, that is, the centers of retinal curvature. In each of these planes lie innumerable lines of direction from each eye, one from one eye intersecting one from the other eye at every point on the circle. The angle of intersection for any two lines is precisely the same as the angle of intersection of any other two lines, for each is an inscribed angle and is measured by half of the same arc. The law of both binocular rest and motion is, *that the ocular muscles must so relate the two eyes that the two visual axes and the two horizontal retinal meridians shall always lie in the plane of the primary isogonal circle, and that the two visual axes shall intersect at some point on this circle, in the interest of both binocular single vision and correct orientation.* That the above law may be obeyed, every

rotation plane must be a meridional plane extended, and the equatorial plane must contain the axis of every rotation. M. B.

THE AMPLITUDE OF ACCOMMODATION AT DIFFERENT PERIODS OF LIFE AND ITS RELATION TO EYESTRAIN.—JACKSON, EDWARD (*Ann. Ophthalm.*, July, 1907). The author never prescribes a pair of glasses until he has measured the amplitude of accommodation, and believes it to be the common practice of ophthalmologists, notwithstanding Dr. Gould's contentions to the contrary. For a good many years he has used chiefly a test composed of the ordinary letters reduced by photography so that the smallest types are just read at 10 inches with normal vision. The cases he presents for study number 3,346 seen in private practice. In Table 1 he presents the averages in diopters for each five years of the patient's age, also the maximum and minimum accommodation. He no longer believes that the greatest amplitude of accommodation is met at birth, but believes that the accommodative power is gradually developed. His second table shows a gradual increase up to the eighth year and then a gradual decline. He thinks delayed development of accommodative power, together with hypermetropia in the very young, may account for some cases of convergent squint. He no longer relies upon the near point in children to give some indication of a latent hyperopia. Cases in which the accommodation falls below the normal average for the patient's age are fairly common. He reports a few such cases. The period of presbyopia should not be at any fixed age. The need of plus lenses should be determined by the degree of accommodation present. His third table shows the relative accommodation of males and females. There is a striking difference at all ages in favor of the males.

M. B.

ANISOMETROPIA.—BRUNER, WM. E., Cleveland, Ohio (*Ann. Ophthalm.*, July, 1907). The author presents 113 cases of anisometropia in the form of a table, showing the refraction of each eye, the glasses prescribed, the muscle balance and the final results. In three cases no attempt was made to correct the inequality. Three tried and gave up the attempt. Two received no benefit. In three the results were doubtful. Partial relief was afforded in eleven cases. In ninety-one great benefit was derived. M. B.

ON SOME FORMS OF HEADACHE.—ELLIOT, R. H., Madras (*The Indian Med. Gazette*, November, 1907). The writer refers briefly to the many forms of headache which are due to easily diagnosable eye affections, such as glaucoma, iritis, etc.; secondly, to the large

class of cases in which headache and other evidence of asthenopia are to be accounted for either by the presence of an error of refraction or by an error in the muscular balance of the eye, and, thirdly, draws particular attention to the lesser or latent errors of the intra- or extraocular mechanism which may lead to chronic asthenopic symptoms. He is convinced that many of the diseases which we treat patients for, and think they have convalesced from, leave a stamp for all future years on the muscular balance of the eye. Influenza and diphtheria are probably the two most dangerous diseases in this particular line. Again, many patients are born with faulty muscular balance, though this may not show till some great strain or the advance of age exposes the defect. The normal eye owes everything to the interdependence of its function of accommodation and convergence.

The point to which the writer leads up is, that a harmonious relationship must be maintained between the reflex actions of accommodation and convergence. It is possible for this to be disturbed on either side. The state of the refraction may be such that an undue or an overdue effort of accommodation may be called for; whilst, on the other hand, the extrinsic musculature may, owing to a fault in innervation or in the state of one or more of the muscles, be unequal to the necessary exertion or may over-exert itself when called into action. All that is present may be a tendency to abnormal deviation of the optic axes. This tendency may be suppressed by a further muscular effort, and may remain only a tendency, whilst at the same time giving rise to asthenopic symptoms of considerable gravity. By the Maddox rod test, by the aid of Stevens' phorometer, or by still other means, it is possible to convert the tendency to deviation into an actual deviation, to ascertain its precise nature and to measure its amount.

To the conditions we are discussing Stevens gave the name of heterophoria. Others have spoken of it as "suppressed squint." The latter term is good enough so long as we remember that the boundary line between a suppressed and an actual squint may never be passed, though lifelong inconvenience may be caused by the condition.

Heterophorias, like apparent squints, may be classified into the paralytic and the concomitant, and the diagnosis between them rests on the same factors as are taken into account in differentiating ordinary squints. The only thing to bear in mind is, that one must first make the heterophoria apparent by one of the meth-

oids above sketched. One can then proceed to a diagnosis in the usual way.

F. A. AND P. G.

PARALYSIS OF ACCOMMODATION IN DIABETES.—DELDOR and RIVEL (*Archives d'Ophthalmologie*, December, 1907) report a case of complete paralysis of accommodation without involvement of the iris occurring suddenly in a hypermetropic diabetic patient and disappearing with the disappearance of sugar in the urine after treatment.

They also quote other cases from literature to show that diabetes, like diphtheria, may affect the centers of accommodation, and suggest that this paralysis may be more frequent than is supposed, as it would be likely to pass unnoticed in case of myopia or presbyopia.

G. C. H.

RETINA.

THE PATHOLOGY OF MACULAR HOLES.—COATS, GEORGE, Curator (Royal London Ophthalmic Hospital Reports, vol. xvii, Part I). A thorough search of the literature on this subject has convinced the author that Noyes, in 1875, was the first to report a case of macular hole. The earliest mention of such a condition was by Knapp, in 1869, though his is a doubtful case. To Pagenstecher and Genth is given the credit of the first pathological examination. Their report was in 1875, but was made without knowledge of Noyes' paper.

Several cases presented by other writers are discussed. The author reports in full all the examinations made. The paper is illustrated with six well drawn microscopical pictures.

The conclusions arrived at may, therefore, be summarized as follows:

"Macular holes are produced by an edema of the retina at the posterior pole. The edema may not be confined to the region of the fovea, but the appearance of a hole will only be produced if there is a defect at least of the inner layers of the retina. Possibly for the completely typical picture, without membranes or shreds, a total defect of all the layers of the retina is necessary, and that such a complete defect may arise from retinal edema is proved by Case 2 above. The edema may result from a contusion, in which case it is the same as the edema which produces Berlin's opacity; or it may arise from toxins in the vitreous, the result of iridocyclitis; or from retinal vascular disease.

"Rupture of the retina at the time of injury is *not* the cause of macular holes. This is proved (1) by those instances which occur without an injury in cases of iridocyclitis, chorioido-retinitis, reti-

nal vascular disease, albuminuric retinitis, etc.; (2) by those cases in which diffuse opacity of the retina *without* hole has been observed after a contusion, and in which a hole has subsequently developed; (3) by Case 4, reported above, in which such a rupture had occurred, but in which the measurements and appearances could not be brought into line with the clinical picture of macular hole."

H. V. W. AND S. G. H.

SOME CASES POSSIBLY ALLIED TO TAY'S INFANTILE RETINITIS.—NETTLESHIP, EDWARD, London (Report of December, 1907, meeting of the Ophthalmological Society of the United Kingdom, *Med. Press*, Dec. 18, 1907). It was suggested that the amaurotic family idiocy of Warren Tay, although usually fatal in infancy, and limited to children of pure Jewish origin, might sometimes be milder, allowing the child to live several years, or even to grow up, and that many families of Gentiles contained more or less Jewish blood. The author thought that cases such as those described by F. E. Batten, Mayou, and others, in which amblyopia with slight changes in the macular region came on a few years after birth, and was sometimes associated with progressive cerebral degeneration, might be mild examples of Tay's disease. Also that the same might be true of certain cases counted as congenital amblyopia, in which there was central defect in the field, and sometimes nervous or mental failure, but no tendency to early death. In the best marked of these cases there was color-blindness, often total and complete, and day-blindness, but in the less severe ones there might be no color defect and no dislike of strong light. All these forms of non-fatal amblyopia were, like Tay's disease, liable to run in families.

G. H. M.

THE RELATION OF ATYPICAL RETINITIS PIGMENTOSA TO HEREDITARY RETROBULBAR OPTIC NEURITIS.—CABANNES (*Archives d'Ophthalmologie*, October, 1907). The ophthalmoscopic picture of retinitis pigmentosa is not always classical; the pigmentation, instead of being arranged in a network of very black irregular figures, like bone corpuscles, located especially in the middle region of the fundus, may be in part or wholly wanting.

These incomplete cases embarrass the diagnosis and the clinician is obliged to depend upon a careful study of the functional symptoms, such as hemeralopia and defects in the visual field.

It appears, therefore, that there may be relations between these irregular forms of retinitis pigmentosa and congenital affections of the optic nerve such as hereditary retrobulbar optic neuritis.

essential atrophy of the optic nerve, hereditary syphilis, optic neuritis, etc. Several cases are reported in illustration. G. C. H.

THREE CASES OF RETINITIS PUNCTATA ALBESCENS.—VAN DUYSSE (*Archives d'Ophthalmologie*, August, 1907). With Fuchs, the author applies this term to an affection characterized by the presence of innumerable small whitish spots scattered over the fundus of the eye. There is a diminution of vision and especially hemeralopia (nyctamopsia) or twilight blindness commencing in infancy. The disease affects several children of parents sometimes consanguineous. It has numerous points of resemblance to retinitis pigmentosa. It was first described by Mooren, in 1882, who observed a case in which the retina showed hundreds of white spots which remained without change for many years. The clinical symptoms are much the same as those of retinitis pigmentosa—twilight blindness, concentric limitation of the visual field and diminution of vision.

The appearance of retinitis punctata albescens in several brothers and sisters calls attention to heredity as a factor. This has also been noted in retinitis pigmentosa, and there is a similarity in the order of transmission; the children affected alternate with those not affected. Consanguinity has also been considered a cause, but did not exist in the author's cases. G. C. H.

SINUSES, NOSE AND EAR.

OCULAR PARALYSIS AND PUPILLARY TROUBLES IN THE AFFECTIONS OF THE EAR, OF THE SINUSES AND THE TEETH, AND IN THE COURSE OF BRONCHO-PULMONARY AND CARDIO-AORTIC AFFECTIONS.—SAUVINEAU (*Annales d'Oculistique*, November, 1907). In affections of the ear the most frequent paralysis is of the external rectus of the corresponding eye. The third pair may also be involved, and paralysis of the superior oblique has been reported.

These paralyzes were at first considered, rather vaguely, as reflex troubles. Then they were attributed to infectious neuritis due to toxins engendered by the otitic infection. But a number of cases have been observed in which the paralysis depended upon a direct propagation of an infectious lesion.

Gradinego was one of the first to establish the relation between paralysis of the fifth and acute otitis media by means of a localized basal meningitis.

Paralysis of the sixth appearing in the course of an otitis is not necessarily a sign of grave complications. Recovery often occurs without the infectious origin ceasing to be admissible.

The external oculomotor may be directly involved by a necrosis of the point of the petrous bone to which it closely adheres.

It is possible that the connections of the sympathetic filaments that accompany the carotid, the sixth pair and all the vessels that nourish the nerves and the vascular walls of the tympanum may be a factor. In a number of cases the walls of the carotid canal are thin and transparent and present spontaneous dehiscences or loss of substance and solutions of continuity which place it in direct contact with the mucous lining of the tympanum.

The occurrence of these paralyses without infectious causes is explained by reflexes arising from the ear and acting upon the ocular nerve nuclei. Schwabach has reported a case in which pressure on the inflamed mastoid provoked oculomotor troubles, and Pfeuger one in which they were caused by the removal of a polypus. In another case forcible syringing for the removal of cerumen caused paralysis of accommodation for several hours.

Affections of the sinuses may affect the mobility of the eye, though usually it is merely a mechanical interference. Real paralyses, however, do occur as the result of sinusitis. Asthenopia and paresis of the internal rectus, of the superior oblique and of the accommodation, as the result of frontal sinusitis, have been reported. External and internal ophthalmoplegia due to inflammation of the sphenoidal sinus has been observed.

Bernheim thinks that these paralyses, when accompanied by any lesion of the orbit, are of toxic origin and are to be compared to the paralyses seen in connection with infectious diseases and auto-intoxication. This seems probable, particularly in the case of sinusitis originating in grippe, but it is nevertheless possible that the motor nerves may be directly affected at the base of the cranium.

Cases of mydriasis and myosis, of paralysis, and spasm of accommodation and of paralysis and spasm of the external muscles due to dental caries have been recorded.

Roque (1872) called attention to inequality of the pupils in unilateral infections of various regions of the body, particularly in pulmonary affections and engorgement of the bronchial and cervical glands, due to a functional excitation of the cilio-spinal center. In many cases published by Rampoldi there was a unilateral mydriasis due to irritation of the sympathetic by a tubercular process at the summit of the lung on the corresponding side. In one case a woman affected with cavernous tuberculosis of the right lung presented a marked myosis of the corresponding side, and

autopsy showed that the inferior ganglion of the sympathetic was compressed in the thickened pleura.

According to Destree, pupillary inequality exists in a large proportion of cases of pulmonary tuberculosis. This anisocoria is not permanent, but may disappear and reappear. Daily examination will show it at times and it constitutes a premonitory sign of pulmonary tuberculosis. The sympathetic irido-dilator filaments pass by the communicating branches of the first dorsal nerve, which is in immediate contact with the superior cul-de-sac of the pleura. According to Deherain the mydriasis may be caused by compression exercised upon the sympathetic by an inflamed mediastinal ganglion, and it is not necessary for this ganglion to be situated at the pleural dome.

Pernot has published the result of his examination of a number of tuberculous patients at various periods of the disease, and his statistics show that pupillary changes are more frequent in the second stage than in the first and still more frequent in the third, or cavity, period. While in the first and second stages mydriasis is observed, in the last stages myosis is more frequent. Some patients in whom mydriasis was observed during their first stay in the hospital returned later with increased pulmonary lesions and myosis due to destruction of the irido-dilator filaments. In some cases the myosis was accompanied by other symptoms of paralysis of the sympathetic, such as retraction of the globe, narrowing of the palpebral fissure, etc.

Mydriasis also occurs in cases of pleurisy with effusion.

Mydriasis on the side of the lung involved is said by some authors to be the rule in pneumonia and has been thought to be associated with other vasomotor symptoms, such as the flush of the cheek.

Inequality of the pupils may occur in certain aortic lesions as a result of irritation of the sympathetic with which the aorta is in close relation. Pupillary changes, particularly the Argyll-Robertson sign, may, however, be due to the syphilitic affection which is the cause of the aortic lesion.

G. C. H.

IRITIS DUE TO THE DISEASES OF THE SINUSES.—MASON, FRANK G., Mason City (*Iowa Medical Journal*, Dec. 15, 1907), says that, though iritis and iridocyclitis due to sinus diseases are comparatively infrequent, they are extremely important, and discusses the pathology of this condition. He records two cases of severe uveitis, in one of which one eye had been enucleated, and in the other one eye was already blind from occlusion of the pupil. In one case

operative procedures on the eye were also necessary, but the relief of sinus inflammation from removal of the anterior portion of the middle turbinate in the first case, and this followed later by the removal of its posterior end in the second case to free the sphenoid cells from pus, resulted in each in recovery from the uveal inflammation. "Headache, lacrimation, disease of the lids, neuralgia, vertigo and muscle imbalance are frequently aggravated and are many times the direct result of sinus disturbance. An ocular disturbance the result of nasal or sinus affections is frequently more pronounced in the morning and is likely to be unilateral."

M. D. S.

OPTIC NEURITIS AFTER DISEASE OF THE POSTERIOR ETHMOID CELLS.—KNAPP, ARNOLD, New York (*Arch. Opth.*, January, 1908, xxxvii, 24), reports a case of involvement of the optic nerve due to an acute posterior ethmoiditis. Examination of the eye showed a neuro-retinitis. V. = 20/lxx. Field: periphery normal; central relative scotoma for white and colors of 5°. The anterior half of the middle turbinate was resected, and posterior ethmoid cells curetted. Seven weeks later vision was normal and fundus normal.

W. R. M.

AN INVESTIGATION INTO THE SIGNIFICANCE OF OPTIC NEURITIS AND OTHER VASCULAR CHANGES IN THE RETINÆ OF PATIENTS SUFFERING FROM PURULENT DISEASE OF THE MIDDLE EAR.—BARR, J. STODDART, and ROWAN, JOHN, Glasgow (*British Med. Jour.*, Nov. 23, 1907). This paper deals with the results of an examination of 100 consecutive cases of purulent otitis media, mostly of the chronic variety, the objects being to determine (1) whether the condition known as optic neuritis occurs with any frequency in cases of simple purulent otitis media, where there is no evidence of intracranial or vascular complications; (2) whether, short of an actual neuritis, vascular changes in the fundus of the eye of a less marked character are common in such cases.

The inquiry showed (1) that vascular changes in the fundus of the eye are far from being uncommon in purulent disease of the middle ear, that in 6 out of the 100 there was optic neuritis, and in 21 there were vascular changes, abnormal in character, but short of optic neuritis; (2) that the ear affections associated with these vascular changes in the eye were specially severe and persistent, as shown by their course, compared with others; (3) that, therefore, the presence of these vascular changes in the optic discs would seem to give an unfavorable character to the prognosis of purulent middle-ear disease—in short, it is a danger signal not to be ignored.

The practical lessons deducible from these are (1) that a case showing these changes in the fundus should be closely watched and their existence should be regarded as an additional reason for the early performance of the radical mastoid operation; (2) if, on the other hand, they show a tendency to clear off, especially with improvement in the ear condition, or if the fundus is normal to begin with and remains so, we may with more confidence look for a favorable response to conservative treatment.

C. H. M.

SYMPATHETIC OPHTHALMITIS.

SYMPATHETIC IRRITATION FOLLOWING MULES' OPERATION.—EMERSON, LINN, Orange, N. J. (*Ophthalmic Record*, 1907), reports the case of a girl of 11 years who developed symptoms of sympathetic irritation six months after a Mules' operation, which persisted for three months, despite treatment, and was immediately relieved as soon as the glass ball was liberated and the sclera allowed to collapse.

M. B.

CLINICAL CONTRIBUTION TO THE STUDY OF SYMPATHETIC OPHTHALMIA.—PECHIN (*Archives d'Ophthalmologie*, September, 1907). The author reports several cases in which examination of the "sympathizing" (the injured) eye showed no sign of infectious inflammation and thinks that, among the rare forms of sympathetic ophthalmia, that called "sympathetic amblyopia," due to ciliary irritation and trophic troubles rather than to infection, should be recognized.

G. C. H.

TOXICOLOGY.

BLINDNESS CAUSED BY ATOXYL.—KOCH, ROBERT. Berlin (*Deutsche Medizinische Wochenschrift*, 1907, No. 46, p. 1889), in his final report on the work of the German expedition for the investigation of African lethargy (sleeping sickness), observed 22 cases of incurable blindness after injections of 1.00 of atoxyl, which never before had occurred in patients not treated or after applications of not more than 0.5 injected on two successive days with intermissions of ten days. Ophthalmoscopically, no changes of the fundus or optic nerve could be detected. Koch therefore resumed the 0.5 doses, with which he succeeded in keeping the blood of patients, suffering from trypanosomiasis free from trypanosomata for ten months and thus prevented the infection of glossinæ through them and the spreading of the disease. Atoxyl is not an infallible remedy, but such a powerful weapon in the combat against sleeping sickness that at present it must be utilized for it as much as possible.

C. Z.

AFFECTION OF THE OPTIC NERVE BY ATOXYL.—FEHR, DR., Berlin (*Deutsche Medizinische Wochenschrift*, 1907, No. 49, p. 2032). Says that, so far, only 2 such cases were observed, by Bornemann (*Münchener Med. Woch.*, 1905, No. 22), and by H. v. Krüdener (*Ztschr. fuer Augenheilk.*, Supplement, 1906, reviewed in OPTHALMOLOGY). (We also refer to the observations of R. Koch, reviewed in this number of OPTHALMOLOGY.) Fehr reports two cases from his own practice, in two women, aged 58 and 61 years, from which he draws the following résumé: Continued use of atoxyl, even in moderate doses, may imperil the eye by an affection of the optic nerve. This may lead to permanent blindness (as in the cases of Bornemann and von Krüdener), but, by discontinuing the drug in time, the deterioration of vision may be checked, as in the cases of the author. The disturbance of sight may commence gradually or suddenly, and it may progress more or less rapidly, without symptoms of general intoxication.

In the 4 cases mentioned the process started with concentric, especially nasal, contractions of the visual field without central scotoma, pallor of the whole optic disc and extreme narrowing of the retinal arteries. Thus a peripheral affection of the optic nerve and alterations of the blood vessels must be assumed. C. Z.

CONTRIBUTION TO THE PROGNOSIS OF RETROBULBAR NEURITIS AND INTOXICATION AMBLYOPIA.—MARX, DR. (From the clinic of Professor Laqueur, Strassburg. *Archiv fuer Angenheilkunde*, 59, p. 28), invited 80 patients, who, on account of retrobulbar neuritis and intoxication amblyopia, had come under observation at the clinic within the last few years, for re-examination. Only 25 returned, who also were examined neurologically. Their clinical histories are reported in detail. Sixteen had retrobulbar neuritis, which in most of them was caused by colds or getting wet. The middle age, from 17 to 34, was predisposed. In almost all vision had failed suddenly and sank to 1/x, generally with severe headaches or dull pain in the orbit on movements or pressure. Improvement set in after two to four weeks and was almost complete after two months. In 50 per cent. the sight was fully restored. Transition into total atrophy occurred in none of the cases.

The visual field was typical, i. e., normal periphery and central, paracentral or pericentral scotomata.

The ophthalmoscopic condition was normal in 8, in 5 the borders of the disc were indistinct, in 2 the nasal, in 1 the lower border. At the final examination, a few months or years later, 4 showed no

anomaly, 7 marked temporal pallor, 5 total pallor of the disc, but such that the atrophic appearance of the temporal half was more pronounced.

In 6 of the cases multiple sclerosis was found after seven and one-half years, six years, three years, one year and six months. In one of them the affection of the optic nerve was preceded by sclerosis for three months.

Since not all cases of retrobulbar neuritis are precursors of a serious nervous disease, it is of great importance to find criteria for those with unfavorable prognosis. In all six cases of amblyopia with multiple sclerosis of Marx the scotoma was relative, the affection of the optic nerve unilateral, in concordance with the observations of Uhthoff. Commencement and course of the visual disturbances differed in no way from acute retrobulbar neuritis. While in the majority of Uhthoff's cases of retrobulbar neuritis, not due to intoxication, the central scotomata were absolute; Marx found this only in 10 per cent. of his cases.

Now follow the clinical histories of 11 cases of intoxication amblyopia. The affection of the optic nerve was bilateral in all with almost equal impairment of central vision on both sides. It generally commenced gradually. The borders of the visual field for white were normal, the central scotoma in almost all cases was relative, only in one absolute. There was no difference of its position in tobacco and alcoholic amblyopia. The time elapsed between the first and last examinations was from one to ten years.

At the final examination a relative scotoma was found in 6 patients who had continued the abuse of tobacco and alcohol. In 2 cases the optic discs were totally pale, in the others only the temporal halves. Most of them presented the aspect of chronic alcoholism, but had no other nervous diseases, especially not multiple sclerosis.

Marx concludes his interesting essay with the following résumé: The prognosis of acute retrobulbar neuritis, with relative central scotoma, of one eye, at the age of from 20 to 35 years, is good as to restoration of sight, but serious as to complications from the nervous system, as a high percentage of his cases had developed multiple sclerosis after from four months to seven years.

The intoxication amblyopia takes a favorable course with regard to amelioration of vision, if the patient abstains from tobacco and alcohol for a certain time. Nervous diseases, as in acute retrobulbar neuritis, are not to be accepted.

C. Z.

TRACHOMA.

THE CHARACTER AND EFFECTS OF TRACHOMA AMONG IMMIGRANTS.—(Editorial, *The Journal of the American Medical Association*, Nov. 23, 1907, vol. xlix, No. 21). Trachoma, Its Character and Effects, Bulletin P. H. and M.-H. S., 1907, prepared by Passed Assistant Surgeons Clark and Schereschewsky, is a thorough presentation of this disease as found among immigrants. During the last twenty-five years the bulk of immigration has come from trachoma-infected Russia and the Mediterranean littoral. The exclusion of trachomatous aliens became a law in 1897, when the disease was classified as "dangerous, contagious," within the meaning of the immigration law. It has been shown that during the fiscal year ended June 30, 1906, alone, 29,000 patients with trachoma were prevented from embarking at foreign ports, and 1,600 individuals with the disease were certified as having trachoma on arrival.

"Reference is made to the difficulty of diagnosis and the responsibility of medical officers engaged in the examination of aliens as compared with that of medical practitioners in general. In the case of the latter an error is of comparatively little moment, while in the former the certification of individuals not afflicted with trachoma would result in untold hardship to the immigrant."

The pamphlet discusses the recognition of the disease from the stage of invasion to the stage of cicatrization and contraction and calls attention to the necessity of everting the eyelids of all suspects. This bulletin should be read by all public health officers and other physicians interested in the prevention of trachoma.

H. V. W. and S. G. H.

ON DISEASE OF THE TARSUS AND LID MARGIN IN TRACHOMA.—RAEHLMANN, E., Weimar (*Arch. Opth.*, November, 1907, xxxvi, 814. Translated from the German Edition, vol. xlvi, No. 3, by Dr. Percy Fridenberg), concludes, from clinical and histological studies, that in trachoma there is an early development of trachomatous tarsitis and that the tissues of the lid margin show an early interstitial blepharitis. He states that the first clinical sign is a change in the secretion of the Meibomian glands, the tarsitis causing this secretion to become abundant, cloudy and oily. A hyperemia of the intermarginal portion of the lids, about the Meibomian glands, occurs, gradually leading to a nodular irregularity of the inner third of the lid margin, while the outer margin is swollen and thickened, and this thickening of the lid margin plays an important part in the development of trichiasis. Along

with the infiltration of the tarsal cartilages the conjunctiva becomes converted into a cicatrix and retraction leads to deformity of the softened cartilage.

W. R. M.

THE TREATMENT OF TRACHOMA WITH BORIC ACID POWDER, WITHOUT MASSAGE.—NOYS, GUY L., Columbia, Mo. (*Ophthalmic Record*, October, 1907), claims that powdered boric acid dusted on the everted lids once daily serves as the safest and surest method of treating trachoma. No anesthetic is used and no massage employed. Some smarting follows for a few moments, during which time the patient holds a wet compress over eyes. This treatment is not as satisfactory in the acute inflammatory stages or when complicated with corneal ulceration and iritis as it is in the later stages.

M. B.

TUMORS.

EPITHELIOMA OF THE LOWER LID.—RUMSZEWICZ (*Postępowanie lekarskie*, Nos. 4-5, 1907). The author first discusses the frequency of palpebral epithelioma. The skin of all organs is most often affected by the carcinomatous process. The lips, external ear and the lids are the most commonly affected regions (Birch-Hirschfeld). The under lid is more often the site of the primitive new growth than is the upper. According to Hartmann's statistics 52.1 per cent. of all tumors affecting the ocular regions occur on the lower lid.

The author gives a detailed description of the microscopic appearances of an epithelioma of the lower lid, which the patient had let go until it was necessary to finally do an evisceration of the orbit, removal of both lids and a portion of the skin of the nose. The defect was covered by Thiersch grafts. After a year the process returned and the right nasal bone and a portion of the maxillary process had to be removed.

K. W. M. (TRANS. H. V. W.).

CYSTS OF THE SCLERA.—WERNICKE, OTTO, Buenos Aires (*Archiv. fuer Augenheilkunde*, 59, p. 23). A girl, aged 5½, had from birth, as the parents stated, a cyst at the upper corneal limbus which gradually grew to the size and shape of a bean, 9 mm. long, 4 mm. wide, fitting to the limbus. It was not movable, tense and not painful. By puncture a watery fluid was emptied and the cyst collapsed, but was refilled after four days. Then its anterior wall was removed with forceps and scissors. No relapse occurred.

Three other cases are quoted from literature. With Rogman, the author considers the scleral cysts as diverticles of the anterior chamber. The aqueous oozes along a blood vessel, penetrating the

sclera into the exterior layers of the sclera and protrudes them in form of a vesicle. After resection of the anterior wall the canal is closed by a cicatricial process. The scleral cysts are congenital, or at least the predisposition of them, and are situated close to the cornea, over which they may extend as in a case of Colburn. They are independent of the conjunctiva, which can be easily dissected from them. Their contents are clear as water and their inner surface is smooth. Generally they grow slowly, but they must be operated on by resection of the anterior wall, as they may involve a danger for the cornea.

C. Z.

PRELIMINARY REPORT OF TWO CASES BELIEVED TO BE INTRA-OCULAR TUBERCULOSIS. CASE 1, TUMOR OF CHORIOID; PROBABLY CONGLOMERATE TUBERCLE. CASE 2, RELAPSING PLASTIC CHORIOIDITIS; PROBABLY TUBERCULAR.—CUTLER, COLMAN W., New York (*Ann. Ophthal.*, July, 1907). The report is most complete in every detail, including opsonic index findings and administration of Koch's T.R. The fundus appearances were changed by the administration of the tuberculin, and gradual improvement of vision followed. There was pulmonary tuberculosis of the incipient type. The ocular disease was more influenced by the tuberculin than were the lungs.

M. B.

A CASE OF INTRAOCULAR TUBERCULOSIS WHICH CLOSELY SIMULATED GLIOMA OF THE RETINA.—THEOBOLD, SAMUEL, Baltimore (*Ophthalmic Record*, October, 1907). A negro of 5 years of age suffered from an injected right eye with a circumscribed scleral staphyloma to the nasal side of the cornea. The intraocular appearances were so strongly indicative of glioma that enucleation was advised. The eye was removed and when examined was found almost filled with a tubercular growth which involved the sclera, chorioïd and retina.

M. B.

A CONJUNCTIVAL CYST OF UNUSUAL SIZE.—BUTLER, T. HARRISON, England (*Ophthalmoscope*, December, 1907). During his recent service in Jerusalem the author removed a cystic tumor from the eyelid of an Arab which measured 2.5x1.75 centimeters. It occupied the upper conjunctival fornix and lay between the conjunctiva and the tarsus.

M. B.

UVEAL TRACT.

CLINICAL CONTRIBUTION TO TUBERCULOUS UVEITIS.—LUBOWSKI, E., Kattowitz (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, ii, 1907, p. 539). The left eye of a man, aged 41, with an affection of both apices of the lungs, became suddenly red. At the

equator, vertically above the cornea, the circumscribed round protuberance of the sclera with ectatic and engorged blood vessels was noticed (scleritis). The ophthalmoscope revealed a gray discoloration of the retina at that place, as in detachment, but the blood vessels coursed in straight lines over it, not tortuously. While the retinal affection disappeared under inunctions with mercurial ointment, the scleritic protuberance moved gradually downward to the limbus. Simultaneously a few deposits at Descemet's membrane had formed. The prompt reaction, by increased temperature and exacerbation of the pulmonary symptoms, to injections of tuberculin proved the tuberculous nature of the disease, and treatment with new tuberculin was at once commenced with 1/500 mgr., increased by 1/500 mgr. every two or three days. After a few injections a marked improvement took place, the swelling subsided, became pale, and the exudations at Descemet's membrane disappeared, and after the tenth injection only a gray discoloration of the sclera was visible, conjunctiva without irritation, $V = 5/v$.

CASE 2.—A woman, aged 46, suffering from chronic iritis of left eye, was in vain treated locally, with iodid of potassium and anti-rheumatics, for nine months. The process ended with diffuse opacity of the whole cornea, circular synechiæ, opacities of the vitreous, $V =$ fingers at 4 to 5 mm. Then, following an otitis media, the so far healthy right eye became affected in the same way, without yielding to treatment. Lubowski, suspecting tuberculosis, although there were no other symptoms of it, injected 0.1 mgr. tuberculin with positive result: The right eye showed greater irritation and the left eye, at that time quiet, grew red and painful. New tuberculin, 1/500 mgr., was now injected and the dose increased by 1/500 mgr. every two days. The irritation of left eye subsided, that of the right eye was unabated.

The author assumed that in this case the primary focus was in the foremost portion of the chorioid or the ciliary body, so that it could not be seen with the ophthalmoscope. The intense involvement of the iris and the profuse exudation into the vitreous corroborated this view.

In the future Lubowski intends to make probatory injections of tuberculin in all cases of uveitis and scleritis in which the anamnesis and general examination give no clue, and especially in those which commence insidiously with slight inflammatory symptoms and in which diffuse dust-like opacities of the vitreous develop early; finally in all cases of relapsing plastic iritis even where rheumatism plays a certain part. A case of this kind is mentioned

in which injection of tuberculin produced great reaction with synechiæ, which disappeared completely after two days. C. Z.

VISION AND COLOR VISION.

THE IDENTITY OF VISUAL AND COLOR SENSATIONS. — TALBOT, GEORGE H., Newtonville, Mass. (*Medical Record*, Dec. 21, 1907). The writer presents a very interesting article for the purpose of proving the identity of visual and color sensations. He reviews our knowledge of this subject and rehearses the various color theories.

"We always think of the form of an object as its distinguishing visual characteristic. If our premises are correct it follows that color should be its peculiar attribute in this respect. If there were no color there would be no visible form. In a dark room the forms of objects are indistinct because the dim rays of light emitted, or, more correctly, not absorbed, are so nearly of the same length that, striking the retina with nearly the same rate of vibration, they do not give any sensation of contrasting color nor any clear outline of form. The color of distant objects is usually apparent before its form becomes distinguishable. Two differently colored contiguous objects are made conspicuous by the contrast in color rather than by their forms. Hence we are justified in saying that it is color rather than form that gives us visual sensations. In other words, visual sensations are but color sensations."

He explains color blindness as a lack of ability of the retinal elements to vibrate in unison with certain colors, just as in some ears there is an incapacity to distinguish between certain sounds — a lack of appreciation of harmony. The defect may be due to an inability of the molecules to vibrate properly, to some defect in the conducting fibers to rightly convey the stimulus, or to some defect in the brain to interpret properly the stimulus.

The article concludes with the following summary: "Light is the effect of undulations of the luminiferous ether. Each color of the spectrum is caused by a definite number of undulations or vibrations per second. It is the normal stimulus to the eye. The percipient parts of the eye are the retina and the essential elements for vision are in the layer of rods and cones and the outer nuclear layer. These, like all other bodies, contain molecules and are capable of the same molecular motion or vibration. When they vibrate in unison with certain colors the sensation of that color is conveyed to the brain, where it is properly interpreted. Visual perceptions are the result of different wave lengths or diffused colors affecting the granules and the rods and cones and protruding

more or less rapid vibrations therein. It is color, rather than form or outline, that enables us to distinguish objects. And, finally, it is color alone that gives us distinct visual impressions." C. H. M.

VISUAL FIELD.

SCOTOMA SCINTILLANS. BERTOZZI, A., Sienna (*Annali Di Ophthalmologia*, Nos. 3 and 4, 1907). A female patient, aged 49 years, had always enjoyed good health with the exception of frequent and transitory attacks of complete blindness accompanied by a sensation of sparks or flashes of light before both eyes. The blindness always began at the point of fixation and gradually increased to complete amaurosis, at which time two luminous images moved zig-zag from the center to the periphery of the V. F. The attacks recurred every twenty to thirty days without premonition. With the cessation of the attack vision suddenly returned to normal; there remained an intense frontal headache which lasted ten or twelve hours. At the age of 40 years the patient noticed bilateral black spots which obscured a small portion of objects and moved with the eyes. The attacks had not yielded to any treatment. The eyes were normal in every respect.

Observation 2.—Female, aged 20 years, the daughter of the first patient. During the past April she had suffered from acute gastroenteritis, probably toxic in character; she recovered perfectly in twenty days. Shortly afterward she experienced an attack of right hemianopsia, which lasted for fifteen minutes and was followed by a zig-zag luminous image in the affected area. This symptom disappeared in about half an hour and was succeeded by frontal and occipital headache of two hours' duration. The attacks recurred frequently without apparent cause. The patient was somewhat anemic, but the various organs were perfectly sound. She was not hysterical, but was nervous and excitable. The eyes were moderately myopic but otherwise normal.

Scotoma scintillans, ophthalmic hemicrania or transitory amblyopia represents an affection extensively studied clinically. Authors are not in accord to the etiology or as to whether it should be considered a special disease. The majority of writers consider the cause to be a circulatory disturbance in the occipital lobe corresponding to the cortical visual area or along the optic way to the chiasm. In the total binocular and monocular central forms the vasomotor disturbance is located in the retina or optic nerve. The short duration of the trouble would clearly indicate a disturbance

of innervation which produces, according to some, a spasm of the vessels and to others a paralysis. Occasionally chronic enteritis and constipation have been blamed as causes of ophthalmic migraine.

R. H. J.

A NOTE ON THE VISUAL FIELD IN HYSTERIA: ITS NATURE AND ITS POSITION IN NOSOLOGY.—DERCUM, F. X., Philadelphia (*Jour. A. M. A.*, Nov. 23, 1907). "Let us now turn our attention to the claims made by Babinski that the stigmata of hysteria (or pithiatism, as he proposes to call the affection) never arise spontaneously, but are always evoked by the examinations of the physicians. It is doubtless true that symptoms can be suggested and are frequently inadvertently suggested by physicians, but it is not true that this is the case with all of the symptoms. In order to make clear his meaning, Babinski explains that it is his custom before examining a patient for sensation to request the patient to notify him when a sensation of contact, of pricking, or some other impression, is experienced. Then the patient's eyes having been closed, Babinski applies to various parts of the integument, sometimes on the left, sometimes on the right side, a camel's hair pencil, the point of a pin and at times warm bodies and cold bodies; then he makes passive movements of segments of the limbs, both upper and lower, and finally he has the patient feel various objects of diverse forms. If the patient does not make an immediate reply, Babinski asks: 'What do you feel; what is it that I am doing?' He never asks the question, 'Do you feel that which I am doing?' or, still worse, 'Do you feel as readily on one side as on the other?' for the latter method may furnish the point of departure of a suggestion. He states that for many years since he has adopted this method he has not been able to discover a single case of hemianesthesia in subjects who before consulting him had not been submitted to a neurologic examination, and that it goes without saying that he has exclusively in mind patients having manifestations incontestably of hysteria such as characteristic attacks. He adds that his experience bears on hundreds of individuals of both sexes. He maintains that contracture of the visual field never develops spontaneously no more than does hemianesthesia, but only as the result of suggestion, and this idea he applies to all the phenomena of hysteria.

"The keynote of his position is that hysteria is a special psychic state which manifests itself by disturbances which it is possible to produce by suggestion and to make disappear under the exclusive influence of persuasion. Unfortunately for the view of this dis-

distinguished neurologist, he fails to recognize the cardinal feature of hysteria which I have here pointed out, namely, a suggestibility which is pathologic. Even if, for the sake of argument, we admit that all the symptoms of hysteria are the result of suggestion, such as may result from unskilled medical examinations, Babinski fails to explain why it is that in healthy persons such suggestions are of no avail. In a normal man or woman a contraction of the visual field can not be brought about by suggestion nor can a hemianesthesia or palsy be brought about by suggestion. Finally, Babinski's view fails utterly to explain some of the remarkable features presented by hysteria, such as the predominance of certain phenomena on one side of the body. It is an experience so common as to go without saying that the ordinary sensory stigmata of hysteria, such as the painful spots under the breast and over the groin, have a special tendency to occur on the left side. This is true also of hemianesthesia and of contracture of the visual fields. If the sensory stigmata of hysteria be entirely a result of unskilled medical examinations, how is it that such phenomena are found more commonly on one side, and that the left? Are we not to seek the explanation in some profound physiologic truth in regard to the difference in the degree of resistance offered by the two halves of the cerebrum? If a cortical reduction takes place in a given case, that cortical reduction, other things equal, takes place first or in most pronounced degree in the right half of the brain; only exceptionally, and doubtless then due to special causes, does it take place first or in most marked degree in the left brain. Further, Babinski's view fails to explain the peculiar association of phenomena, such as the occurrence of a contracted (or most contracted) visual field on the same side as the hemianesthesia, nor even the habitual association of anesthesia with paralysis. Other features, such as the reversal of the color fields, the peculiar limitations and distributions of clavus, of groin pain, of inframammary tenderness and of spinal tenderness are, to say the least, equally difficult of interpretation on Babinski's view." H. V. W.

Book Reviews.

Text-Book of Ophthalmology. FUCHS, ERNST, M.D., Professor of Ophthalmology in the University of Vienna. Authorized translation from the eleventh revised and greatly enlarged German edition, with numerous additions by DUANE, ALEXANDER, M.D., Surgeon Ophthalmic and Aural Institute, New York. With 441 Illustrations. 908 Pages. Third Edition. \$6. J. B. Lippincott Company, Philadelphia and London. 1908.

Nine years have elapsed since English-reading practitioners have been favored with an edition of Fuch's Ophthalmology. Since that time four German editions have been issued and the science of ophthalmology has made material progress.

We are indebted to the translator, Alexander Duane, for valuable additions to the text whereby he brings in the latest thought of Anglo-Saxon ophthalmologists. His additions are especially noteworthy in Part One in the chapters on objective examination and functional testing of the eyes; in Part Two on the disturbances of motility; in Part Three on anomalies of refraction and accommodation, and in Part Four on operations.

Professor Fuchs' scientific treatise is as ever thorough, accurate and well balanced. Each subject is presented with a comprehensive exposition of anatomy and pathology—the solid rock upon which we must base our conception of disease and its treatment. The author's revisions in this edition are mostly seen in the section on diseases of the cornea, pathology of iritis, sympathetic ophthalmia, chorioiditis, glaucoma, diseases of the optic nerve, the disorders of motility, diseases of the orbit and refraction.

The text is attractively bound and liberally illustrated. Over one hundred illustrations have been added to the volume, including the beautiful colored fundus pictures of De Schweinitz, Würdemann, Haab and others taken from Posey and Spiller. It can be safely said that Duane's edition of Fuch's Text-Book of Ophthalmology is the best book on this subject printed in the English language to-day.

SAMUEL G. HIGGINS.

Ophthalmia Neonatorum. STEPHENSON, SYDNEY, M.B., C.M., Ophthalmic Surgeon to Queen Charlotte's Hospital, London, etc., etc. (The Middlemore Prize Essay of the British Medical Association, 1907.) Published by George Pulman & Sons, Limited, London.

This most comprehensive treatise on this subject is presented in a volume of 258 pages. It would appear that the author has explored the literature most minutely and has used such portions of

it as best serve to statistically illustrate every possible phase of this most unfortunate disease. He shows conclusively that two-thirds of the cases of ophthalmia neonatorum are due to the gonococcus, and that the other one-third is responsible to other well-known germs, such as the pneumococcus, etc. Under prophylaxis, he endorses Credé's method, but believes that a 1 per cent. solution of silver nitrate is sufficiently strong to prevent infection. In the treatment of the gonorrheal form he advocates the use of argyrol, but does not hesitate to reinforce it by the occasional use of nitrate of silver. This essay so fully covers the subject of ophthalmia neonatorum that it must stand for years as a valuable book of reference.

MELVILLE BLACK.

Transactions of the American Ophthalmological Society.—Forty-third Annual Meeting. Washington, D. C., 1907. Vol. XI. Part II, 1907. published by the Society.

This is a paper-covered volume of 453 pages, giving in full the list of members and minutes of the proceedings. The essays presented to the society, with the discussions, are printed in full. The individual essays have been published in various ophthalmic journals and are reviewed elsewhere among the abstracts in OPTHALMOLOGY.

SAMUEL G. HIGGINS.

Cosmetic Surgery.—MILLER, CHARLES C., M.D. Including the Description of a Variety of Operations for Improving the Appearance of the Face. 136 Pages. 73 Illustrations. Prepaid, \$1.50. Published by the Author, 70 State Street, Chicago, Ill.

This octavo volume of 136 pages is of much interest to specialists, especially to the eye and ear surgeon, as we commonly do many of the operations described in the work. It is the result of experiences of the author in the treatment of featural imperfections, which is one of the latest specializations of the art of surgery. Many of these operations are done under local anesthesia and come under the head of minor surgery. The book is certainly a valuable contribution to the subject and contains much material that is not noted in general or special works on surgery.

H. V. WÜRDEMANN.

Text-Book of Otology.—BEZOLD, FR., M.D., Professor of Otology at the University of Munich, and SIEBENMANN, FR., M.D., Professor of Otology at the University of Basle. Translated by J. HOLINGER, M.D., of Chicago. E. H. Colegrove Co., Chicago. Price, \$3.50.

A large majority of our readers are workers in otology as well as in ophthalmology. Thus I believe it well to occasionally include

reviews of the much advanced works on otology as we do with the advanced general medical works in our columns.

The names of Bezold, the author, and of Holinger, the translator, are in themselves sufficient to commend the work. The original work in German is a standard and to it the American author has made sufficient additions to bring the work up to date. The scholarly translations of the lectures by Bezold makes the work of additional interest.

The work embraces the anatomy and physiology and all of the diseases of the hearing apparatus. It is exceptionally interesting on account of the individuality of the authors and for their original investigations and the careful statistics accompanying the description of each disease. This is the first occasion where Bezold's and Siebenmann's investigations are offered as a whole in English. Especially is the subject of diagnosis of invisible diseases of the ear, based upon the characteristic changes of function, well elucidated. The relation of the diseases of the auditory apparatus to general diseases is of particular interest to all medical men.

H. V. WÜRDEMANN.

Text-Book of Ophthalmology.—VOSSIUS, ADOLF, PROF. DR., Director of the Eye Clinic in the University of Giessen. Fourth, Enlarged and Improved Edition of the Compendium of Ophthalmology. 933 Pages, with 275 Figures in the Text and a Section Through the Eyeball. Leipzig und Wien. Franz Deuticke. 1908. 16 M. \$4.00.

The well known and very useful compendium of Vossius has, with its fourth edition, grown out to a stately volume of twice the number of pages. By this expansion it has greatly gained in intrinsic value, so that by its completeness and thoroughness it deserves a prominent place among the large array of excellent modern text-books of ophthalmology. The special part of 15 chapters is preceded by valuable general remarks on examination, diagnostics, etiology and treatment of ocular affections. Deviating from the usual arrangement of the subject matter in ophthalmological text-books we find here quite a number of special chapters, as on empyema of the frontal, maxillary and sphenoidal sinuses, congenital anomalies of the globe, skin diseases, sympathetic ophthalmia with a detailed discussion of the various theories, general remarks on amaurosis, injuries and their economic valuations, etc. The conscientious and critical utilization of the most recent literature is everywhere noticeable and the original authors being mentioned, but not where to find their articles, which for the most important ones might perhaps have been made possible by proper abbrevia-

tions with a key. The external appearance, print, paper and illustrations, partly colored, mostly original, are unusually good and, by the judicious display of catch words through larger type orientation is greatly facilitated. The wish of the author, who as clinical teacher gives here the results of his scientific studies and experience gathered within the last twenty-five years, that those who consult his book may find the desired information, will certainly be fulfilled, and his great work will be greatly appreciated.

C. ZIMMERMANN.

A Manual of Toxicology.—BRUNDAGE, ALBERT H., A.M., M.D., Phar.D., M.S., Professor of Toxicology and Physiology in the Departments of Medicine, Dentistry and Pharmacy of Marquette University, Milwaukee. A Concise Presentation of the Principal Facts Relating to Poisons, with Detailed Directions for the Treatment of Poisoning. Also a Table of Doses of the Principal and Many New Remedies. Fifth Edition, Revised and Profusely Illustrated. 1907. The Henry Harrison Co., Brooklyn, N. Y. Price, with Colored Plates, \$2.00 net.

The appearance of a fifth edition at this time speaks well for the popularity of this manual.

The subject of toxicology is approached from all sides, including the effects of poisons upon pupillary reaction and visual disturbances.

This is believed to be the only book having outlines for laboratory work in experimental toxicology. The plates on effects of poisoning are of greater variety and more accurately represent the severe effects of poisoning than any other book published.

The typography is better than found in many more expensive text-books.

SAMUEL G. HIGGINS.

Operations on the Eye.—CZERMAK, PROF. DR. WILHELM. Die Augenärztlichen Operationen. Second Enlarged Edition. By ELSCHNIG, ANTON, Professor and Director of the Eye Clinic in the German University of Prag. Vol. 1, Second Half, pp. 327-572, with Numerous Illustrations and Prefaces, Index and Introduction.

The first half of the first volume of this monumental work of Wilhelm Czermak was reviewed in the January, 1907, number of OPTHALMOLOGY, p. 348, to which we beg to refer. In the second half also a considerable number of changes and insertions have been made by the editor, Professor Elschmig, e. g., in discussing the extirpation of the tear sac, resection of the orbital walls, with an entirely new chapter on the treatment of the accessory sinus, as the surgical treatment of the frontal sinus, describing the methods of Kuhnt and Killian, of the ethmoidal cells, modifications of the osteoplastic resection of the external orbital wall, by Czermak, local

anesthesia in enucleation of the eyeball, exenteration and enucleation with implantation of a prothesis. Under the operations on the ocular muscles, the tenotomies of the superior and inferior recti and obliques, two supplements, containing Elschnig's views on strabismus and the therapeutic effect of its operative treatment, and other indications to operations on the muscles, are, besides numerous smaller paragraphs, newly inserted. Quite a number of well-executed new illustrations have been added. Although the index is well prepared, we repeat our suggestion, that for better orientation, the contents be indicated by headlines at the top of each page. As mentioned before, the excellent work is indispensable to every ophthalmologist.

C. ZIMMERMANN.

History of Ophthalmology.—HIRSCHBERG, J., Berlin. *Graefe-Saemisch Handbuch der gesamten Augenheilkunde.* Second, Entirely New, Edition. Nos. 122 to 125, pp. 353 to 546, with 13 Figures in the Text and 7 Plates. Leipzig. Wilhelm Engelmann. 1908. Subscription 8 M. \$2.00.

In these numbers Hirschberg narrates the renaissance of ophthalmology in the eighteenth century. Although the doctrine of vision was founded at the beginning of the sixteenth century, the renaissance of ophthalmology did not commence until 100 years afterward. Decisive for it was the controversy about cataract. This is described in the first section, in which is shown that a whole century, from 1650 to 1750, scarcely sufficed to ascertain by an adequate number of observations, that cataract consists in an opacity of the lens, rarely of its capsule. The greatest share in this combat was achieved by the younger Bristatt, whose little book, "*Traité de la Cataracte et du Glaucoma*, Paris, 1709," is reproduced in translation. Antoine Maître-Jan proved in his "*Traité des Maladies des Yeux*" of 1707, by experiments with the camera obscura, that the eye could see, although not distinctly, without crystalline lens. By his observations in reclination and postmortem examinations he found that cataract was an opacity and hardening of the lens. His teachings exerted a great influence on the French Academy of Sciences, of which he was a member. The annual report of the Academy of 1708 endorsed the new discovery. Then the fight against it by the opponents, especially Thomas, Woolhouse, Hovitts, Freytag and others, is discussed, followed by the history of its support in the different countries, viz.: Heister, Boerhave, Valsalva, Morgagni, John Taylor, Charles de Saint-Yves and Petit, with a retrospect on the old doctrine of cataract and its modernization.

The second section describes the formation of the artificial pupil.

its invention by William Cheselden, 1728, and its further fate, and the third the extraction of cataract, Jaques Daviel's great invention, with a full quotation of his essays, closing with a review of the further development of cataract extraction up to date. Hirschberg's book brings verbatim many of the most important sources which so far have not been accessible. Besides its unsurpassed historical value it is a most fascinating work to read. The artistic plates represent portraits of Heister, Cheselden, Daviel, an allegory on Daviel's invention, his cataract operation, and cataract knives.

These numbers conclude volume xiii of the great hand-book. Very tasteful solid leather covers for binding may be had from the publishers for 35 cents. C. ZIMMERMANN.

Stereoscopic Pictures. Twenty-Four Plates for Persons Affected with Squint.—V. PFLUGK, A., DR., Dresden. Second Edition. Wiesbaden, J. F. Bergmann. 1907. 2.80 M. \$0.70.

From his experience the author thinks, in concordance with many others, that the number of cases to be operated on for squint may still be more reduced than has been done within the last few years, since, with sufficient patience, better results may be obtained by non-operative measures. Among these, stereoscopic exercises deserve a prominent place. A most important factor in these is that the distances between the two half pictures can be varied, and the plates of von Pflugk are constructed according to this principle. In order to do this more systematically, the cardboard on which the pictures slide has a scale in centimeters and millimeters and certain marks corresponding to those on the pictures. The picture board must be fitted to the slide of the ordinary stereoscope, if not a stereoscope devised by the author and obtainable from the publisher for 2.60 marks (\$0.65) is desired.

Most of the pictures, and this is another essential point, consist of such figures as to develop perspective vision and therefore deserve preference over those which simply aim at fusion of the half images. The second edition has been increased by six plates, representing the geometric solids, as prism, cube, cylinder, pyramid, cone and sphere, on dark ground, and four for exercises in vertical deviations with a vertical scale. An explanatory text gives directions for use. The plates are tastefully executed and deserve commendation. C. ZIMMERMANN.

Blanks for Recording Ocular Palsies.—WÖLFFLIN, E., Privat Dozent, Basel, *Schemata fuer Augenmuskellähmungen*. 25 Sheets in Envelope. Wiesbaden, J. F. Bergmann. 1907. 1.30 M. \$0.35.

Each sheet has nine squares, divided by horizontal and vertical

lines into small squares on the principle of graphs. The red image is represented by a red vertical line in the center of each large square. A margin is left for date, name, diagnosis and remarks. The blanks will be found to be very useful for recording ocular palsies at different stages.

C. ZIMMERMANN.

Microscopic Anatomy of the Exterior Ocular Tunic.—VIRCHOW. HANS. PROF., Berlin. *Graefe-Saemisch, Handbuch der gesamten Augenheilkunde*. Second, Entirely New, Editions. Nos. 126 and 127, pp. 161-320. Leipzig. Wilhelm Engelmann. 1908. Subscription, 4 M. \$1.00.

These numbers contain in the same exhaustive fashion commended in our review of the first part (OPHTHALMOLOGY, October, 1906, p. 171), descriptions of the nerves of the cornea and their terminations, with historical remarks and a synopsis on the sensibility of the cornea, Descemet's membrane, discussing also its formation and regeneration, the sclerotic, Tenon's capsule, perichordial space, and the sinus of the anterior chamber in man and various animals, with 34 illustrations, founded on original investigations and critical utilization of the copious literature.

C. ZIMMERMANN.

Tuberculosis as the Etiologic Factor of Chronic Inflammation of the Eye and Its Adnexa, Especially Chronic Uveitis.—STOCK, W., Privat-Docent and First Assistant at the Eye Clinic in the University of Freiburg i. B. 103 Pages, with 2 Plates and 14 Figures in the Text. Leipzig. Wilhelm Engelmann. 1907. 3 M. \$0.75.

The author gives here the results of his investigations of the last five years, undertaken with the object to throw more light on the still rather obscure chronic inflammations of the eye, especially of the uveal tract, so often deleterious on account of their gravity and the uncertainty of therapeutics. As the mere clinical observations did not yield sufficient information, as shown by a review of literature, Stock approached the question by experiments on rabbits, of which 44 are reported in detail, with a synopsis of results. Then follow experiments to ascertain the etiology of chronic uveitis in man by inoculations of pieces of iris and aqueous into the anterior chamber of rabbits and guinea-pigs, and the anatomo-pathological examinations of eight eyes affected with chronic uveitis. As the inoculations proved negative, 59 cases were tested with old tuberculin, some of which are reported. In the therapeutic part the favorable experiences with new tuberculin are described. The author has by his elaborate researches materially fostered the knowledge of tuberculosis in the etiology of chronic uveitis.

The interesting and practically very valuable essay, without any

appeared in *von Graef's Archiv*, (reviewed in this volume in OPHTHALMOLOGY, p. 310), now edited in book form and thus made accessible to a larger circle of readers, is urgently recommended.

C. ZIMMERMANN.

Comparative Investigations on the Indices of Refraction of the Lens and the Liquid Media of Man and Higher Animals at Different Ages.—FREYTAG, GUSTAV, DR., München. "Vergleichende Untersuchungen ueber die Brechungsindices der Linse und der Fluessigen Augenmedium des Menschen und hoeherer Tiere in verschiedenen Lebensaltern." 78 Pages, with 3 Figures in the Text. Wiesbaden. J. F. Bergmann. 1907. 2.70 M. \$0.70.

After a review of literature, Freytag reports his own elaborate investigations on the indices of refraction of the normal lens, cataractous lens substance, aqueous and vitreous body of the pig, sheep, goat, cattle, horse and man, partly arranged in tabular form, and an appendix on the measures and weights of a number of lenses. The results are summarized at the end.

Freytag found that the superficial stratum at the equator has the lowest index, at all ages. It rises to a maximum at the poles. The difference between index of the nucleus and that of the surface waxes from birth up to the highest age in animals, only slightly in man. An increase of homogeneousness at a higher age, according to Donders, is not physiological. The index of the center of the nucleus of cataractous lenses is generally increased, especially in nuclear cataract, sometimes however diminished. Aqueous and vitreous do not change their refractions during life, that of the aqueous is constantly somewhat higher.

The interesting essay, describing in detail the author's careful methods of investigation, deserves a closer study.

C. ZIMMERMANN.

German-English Medical Dictionary.—WALLER, JOS. R., M.D. Fourth Edition, Improved and Enlarged. By WHITE, M., M.D. 449 Pages. Leipzig and Vienna. Franz Deuticke. Cloth. 6. M. \$1.50.

This dictionary will be of great assistance to English-speaking physicians in their studies of German medical works, and also to Germans who wish to learn the English medical terms. The definitions are in general clear and concise, but there are some inaccuracies and mistakes in the German and in the English words, at least as used in the United States.

For instance: "Chromsauer, chronic," is there, but not "Chromsäure, chromic acid;" under "Mehrfachsehen, double or multiple vision," we miss "polyopia;" under "Anlage" "proton;" "Bastard" is the German for "hybrid," not "Zwitter;" "Zopf" means "plait,"

not "plica," except in the expression "plica Polonica, Polish plait, Weichselzopf." Under "Ausschlag" we miss "deviation" (of an instrument). "Schlafkrankheit, sleeping sickness, African lethargy" is omitted; "Wechselfieber" is not only "intermittent fever," but the German term for "malaria;" "ovarian tube" means "Eileiter, Mutttertrompete," not "Eischlauch." The English term for "Pupillenstarre" is "Argyll Robertson's pupil," or "reflex iridoplegia." "Pulverbläser" ought to be "powder blower." "Probe-punction" means "exploratory puncture," not "punction." "Dura mater" is not "obere" Hirnhaut, but "harte;" "pia mater" not "untere" but "weiche." "Einfallslot" is translated as "ordinate;" the usual expression is "perpendicular."

The author states in the preface that "we have taken entirely notice of the modern orthographical innovations in the German language." This means e. g., that C is spelled Z before e and i, and K before a, o, u. The reader must bear this in mind, as quite a number of German publishers have not yet adopted these (unetymological) changes. But also here the dictionary shows some inconsistencies, as "Ciliarfortsatz" (ciliary process) e. g., and all other compounds of "ciliar" are spelled with C, but "Ziliarfortsatz" reappears alone without the others under Z, while "Zentrum" and its derivatives are classed under Z. The date of the preface, "mars, 1907," is a misprint, also "stramomum" and "camel hair brush."

Paper and print are very good. The German words are, in happy contrast to the prevailing custom in German-English dictionaries, printed in English letters. The different sizes of type for each language enhance orientation for quick reference most effectually.

C. ZIMMERMANN.

Clinical Dictionary.—DORNBLÜTH, OTTO, DR., Frankfurt a. M. "Klinisches Woerterbuch. Die Kunstausdrücke der Medicin." Third, Considerably Enlarged, Edition. Leipzig, Verlag von Veit & Co., 1907. Cloth. 5 M. \$1.25.

Modern medicine abounds in so many new terms, taken from foreign languages, that even one most familiar with literature can not know the meaning of all of them or remember them. The bad habit of naming diseases and symptoms after their discoverers considerably adds to this predicament. Therefore the author collected in this dictionary the most common foreign words with briefly mentioning their etymology and meaning and the most important technical terms from ancient and modern, in altogether 28 languages. After each word of a foreign language the latter is indicated by abbreviations and after those derived in a changed form the Greek and Latin the etymology is added in italics. Thus

the book serves also to the readers of other languages than German as a splendid supplement to the general dictionaries.

It is very complete, very accurate, and gotten up in a very attractive and handy form, and may be cordially recommended as a most useful work.

C. ZIMMERMANN.

Lectures on Physical Chemistry for Physicians.—COHEN, ERNST, Utrecht. Second, Enlarged Edition. 264 Pages, with 53 Figures. Leipzig. Wilhelm Engelmann. 1907. Cloth. 9 M. \$2.25.

The description in modern medical literature of a large number of researches, which are based on physicochemical conceptions, demand for their understanding from the physician a knowledge of the theories and methods of physical chemistry. These lectures are intended to propound the intimate connection of this young branch of chemistry with biological science and to discuss in detail its most important methods, under the following headings: Velocity of reaction, obtaining constant temperatures, inversion of sugar and catalysis, fermentative actions, equilibrium, solubility, interior friction and tension of surface, osmotic pressure, diffusion, determination of the molecular weights of dissolved substances, electrolytic dissociation, the doctrine of disinfection in the light of electrolytic dissociation, toxic actions, osmotic analysis, electromotor actions, etc.

The exposition is very clear, and the book will be welcome to many physicians who will read it with great interest and profit. Paper, print and illustrations are very good.

C. ZIMMERMANN.

Letters of Theodore Billroth.—FISCHER, GEORGE, DR., Hanover. Briefe von Theodor Billroth. Seventh, Enlarged Edition. 622 Pages. Hanover und Leipzig. Hahn'sche Buchhandlung. 1906. Cloth. 15 M. \$3.75.

Within eleven years the letters of Billroth appeared in seven editions, a striking illustration how eagerly they were coveted by physicians at large and educated laymen. Billroth, one of the greatest surgeons and pathfinders of his time, had the desire to express in letters the rich world of his thoughts, even to friends living in the same city with him. Thus nothing can better, than his letters, delineate a picture of this superior man, his noble character, his many-sided talent, his striving and contests for the truth in life, science and art. Writing came easy to him, imparting to his letters the charm of spontaneity clad in the most fascinating style.

The new edition, increased by a number of letters, recommends itself as a most precious gift of delightful reading. The external appearance, paper, print and binding are excellent

C. ZIMMERMANN.



Fig. I.
Sarcoma of the Choroid.
Ophthalmoscopic appearance of Case I. four years before
enucleation.
(Lefever)

OPHTHALMOLOGY

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Original Articles.

SARCOMA OF THE CHORIOID, WITH A REPORT OF THREE CASES.

C. W. LE FEVER, M.D.

PHILADELPHIA.

(Illustrated by colored plate and five half-tones.)

Sarcoma of the chorioid is sufficiently rare and its early recognition and eradication of sufficient importance to justify the report of any case or prompt the publication of any helpful suggestion.

The writer hopes, in presenting these three cases, to show by means of illustrations of the macroscopic specimens, together with the clinical histories, something of the rate of growth, the destructive changes which are produced and their relation to the symptoms and diagnosis.

Of the three cases, two were under observation four years and the third but four weeks previous to the dates of operation. In none was there a history of any kind of malignant tumor affecting a near relative; in none was there a history of traumatism which was definite, although in one patient there had been a bump of the orbit against the edge of a half-open door about one year before the onset of the ocular symptoms. This may or may not have been causative to the sarcoma which followed. All had enjoyed good health up to the time of beginning failure of vision. Two were in men and the third in a woman. All were native-born Americans of Anglo-Saxon extraction. Two were in the beginning of the fifth decade of life and one in the sixth. In two the left eye was involved and in one the right. In one the growth sprang immediately from the macula and in the other two from the temporal region, between the macula and the ora serrata. In one case there were inflammatory symptoms; that is, the second stage had been reached, and in the other two there were none. In the largest growth a portion of the

field was preserved up to the time of operation, while in the two lesser ones there was complete detachment of the retina with total blindness. Two were melanotic and the third a leucosarcoma.

When sarcomata of the chorioid were first recognized as malignant growths it was thought that they were always pigmented, and it was not until Virchow made his study in von Graefe's clinic in 1863 that it became known that pigmentation, while the rule, was not essential to sarcoma in this structure. Since that time much has been written upon the subject and something like 600 cases have been reported. Fuchs collected 221 cases in 1882. Lawford and Collins, 94 cases in 1891, from Moorfields. Pawel, 100 cases in 1899, from the clinic at Halle. Kershbaumer reported 47 cases in 1900 from Leipzig, and Hirschberg reported, in 1905, 63 cases seen by himself in the preceding 31 years.

Knapp has divided the course through which these growths pass, if not arrested by eradication, into four stages. The first stage covers the period until secondary glaucoma or other inflammatory symptoms develop; the second stage that of inflammatory complications; the third stage that of local extension, and the fourth stage that of recurrence, either in the orbit or by metastases.

Etiology.—Beyond the fact that traumatism acts as an exciting cause, we are almost without knowledge concerning the etiology of sarcoma of the chorioid. Hereditary influence is recited as a cause, but it is doubtful whether such a history, when it is obtained, is more than a coincidence.

Age.—The ages at which the writer's three cases occurred are within that period at which the occurrence of this form of malignant growth is most frequently seen, that is, between 40 and 70. The cases already on record show that about 70 per cent. occur within this period. There is no age, however, at which sarcoma of the chorioid may not develop. A few cases have been reported under the age of 10 years, and an unreported case seen by the writer in the practice of Dr. E. L. Klopp was but 4 years of age at the time of enucleation and had been under observation $2\frac{1}{2}$ years when operation was consented to. This case recurred in the orbit.

Rate of Development.—Sarcomata within the eyeball are probably seen earlier in their course than in any other part of the body. This is due to the ease with which the delicate structures of the eye are disturbed and the readiness with which minute objects are seen in the eye-grounds by means of the ophthalmoscope. Case 1, when first seen, was not larger, by actual measurement, than a match head and, although situated the width of itself from the fovea,

had lowered vision to 20/lxx. The rate of development varies according to the nature of the growth, the small round-celled variety being the most malignant, which, of course, means the most rapid growth. As Zeigler has pointed out, the leucosarcomata are of this type. The clinical history and ophthalmoscopic records of Case 2 well illustrate this point. This case, as will be seen, began to have failure of vision four years before the date of enucleation, but there was no elevation of the retina or other evidence of a tumor until within the last year. The only changes in the retina being a number of peculiar yellowish gray areas in the macular region and extending a little templeward. The changes went on for three years, when detachment of the retina began, and in less than one year a tumor measuring 14 mm. in its greatest diameter had sprung up. The visual acuity in this case in September, 1903, was 20/xxx, in September, 1904, it was 20/lxx, in June, 1906, it was down to 5/cc, with no growth. From this date until June, 1907,

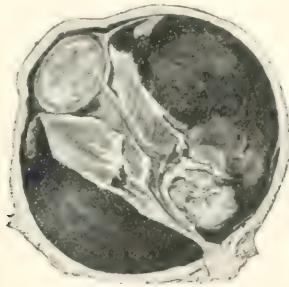


Fig. 2. Case I.—Sarcoma of the chorioid: white mass is exudate, (LeFever.)

there is a lapse in the writer's notes of the case, but Dr. E. S. Saylor, who saw the patient in the interim, very kindly reports that on May 1, 1907, when the patient was first seen by him, vision amounted only to counting fingers at 0.25. The retina was detached over more than half the fundus, to the temporal side, including the macula. The retina was smooth and rounded like a ball and the media were clear. There were no inflammatory symptoms. The elevation was about 6 mm.

In contrast to this was the clinical history of Case 1. This case was also under observation four years, and during this time the growth amounted only to a change in size from 2 or 3 mm. to 6 mm. This growth was of the pigmented variety. In both instances the eye-grounds were painted by a trained artist when the cases were first seen. This eliminates the possibility of mistaken records.

Time of Retinal Detachment.—The time at which the retina becomes detached, beyond the limits of the growth, varies very greatly and is often unexplained by any condition which can be seen. Oatman claims that if the growth is located near the posterior pole of the globe complete detachment will be late. The three cases here reported do not confirm this observation. They were all centrally situated, and from this reasoning the largest should have had the earliest complete detachment. On the contrary, the largest did not have complete detachment at the time of enucleation, although it had reached the second stage of its course. Parsons observes that detachment will likely be late if the growth is near the ora, but qualifies this by stating that it probably depends upon the presence of inflammatory exudate, which varies in different cases. To the writer this seems rational, and from our knowledge of retinal detachment, in the absence of a growth, we should expect early detachment when the tumor is above, by the laws of

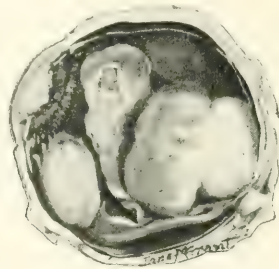


Fig. 3. Case II.—Sarcoma of the choroid, non-pigmented. Retina completely detached. Lens dislocated in mounting. (LeFever.)

gravity, if fluid exudate be present. In Cases 1 and 2 the retina was thrown forward like a funnel from the nerve-head to the ora, while, as already mentioned, this did not occur in Case 3, the retina remaining adherent to the top of the growth and to the choroid on the nasal side. The detachment was of the "umbrella" type, the fundus being visible entirely around the tumor. Parsons observes that if the sarcoma assumes the shape of a mushroom the retina is apt to adhere to the top. Case 3, from the illustration, is seen to be of this shape and the capsule of the choroid can be seen extending over the broad base, the "head" having perforated this membrane.

Recurrence.—The probability of complete eradication of sarcomata is greater when they occur within the eyeball than at any other point in the body. If the case is seen early, the diagnosis promptly

made and the surgeon's advice accepted, recurrence of sarcomata of the chorioid should be reduced to a rarity. Statistics to the present time show that 30 per cent. of the cases operated upon recur either locally or by metastases, the latter being by far the more common manner of recurrence. Fuchs' percentage was about 19 in 243 cases, but many of them had not been long under post-operative observation. If the sclera has not been invaded before enucleation recurrence is not likely, but this fact does not eliminate the danger of recurrence by metastasis. The process of metastatic recurrence is not definitely known, but since the lymph circulation between the inside and the outside structures of the eyeball is not free, it is probable that the cells are carried from the interior of the globe by means of the vena vorticosæ and thence into the general circulation. The fact that recurrence is more common in the liver than elsewhere substantiates this theory. The liberation of cells which are to form the secondary nidus must have taken place

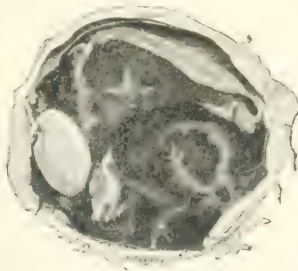


Fig. 4. Case III.—Pigmented sarcoma of the chorioid. Retina not completely detached. (LeFever.)

before or at the time of operation. If the former, the secondary involvement would have shown itself in the form of multiple sarcomata had no operation been done.

From our knowledge of the rate of growth we may assume that actual recurrence will not be delayed longer than five years, but its recognition may be delayed much longer, especially if it recur in one of the large viscera. A tumor of the size to destroy vision would probably not be perceptible if located in the liver.

Diagnosis and Treatment.—With a predilection of the uveal tract for sarcomata, it is clearly our duty in any case of sarcoma, whatever the location, to watch for metastatic ocular involvement, especially if the case be operated upon.

Since traumatism is a known element in the causation, any instance of new formation in the vascular tunic or retinal detachment

in an eye known to have been previously injured must be looked upon with suspicion. Holden, writing in the "American Text-Book of Diseases of the Eye, Ear, Nose and Throat," recommends that in cases of retinal detachment of doubtful diagnosis where sarcoma is suspected a scleral puncture be done to determine whether the detachment is due to fluid behind the retina. This, to the writer's mind, is distinctly dangerous practice and should never be done. Such a puncture into a sarcoma, especially of the soft



Fig. 5, Case III.—Low power microscopic section, showing cells, connective tissue and blood channels. Some cells have fallen out. (LeFever.)

variety, would certainly be followed by the escape, into the orbital tissues, of cells and a transplantation accomplished. During enucleation the greatest care should be exercised not to unduly manipulate, rupture or squeeze the globe, lest sarcoma cells be forced into the tissues or the blood circulation. It must be remembered that these tumors are very vascular and that the vessel walls are imperfect.

Enucleation is to be recommended as early as the diagnosis can be made, and the patient warned of the danger in delay. It usually requires a year or so of failing vision, perhaps complete loss of sight, and the opinion of several oculists, to bring the patient to a state of mind where he will consent to the loss of the eye. Consultation should be encouraged. For at least five years, and, better, during the remainder of life, these patients should be kept under close observation for recurrence, in the stump or elsewhere, and especially in the liver.

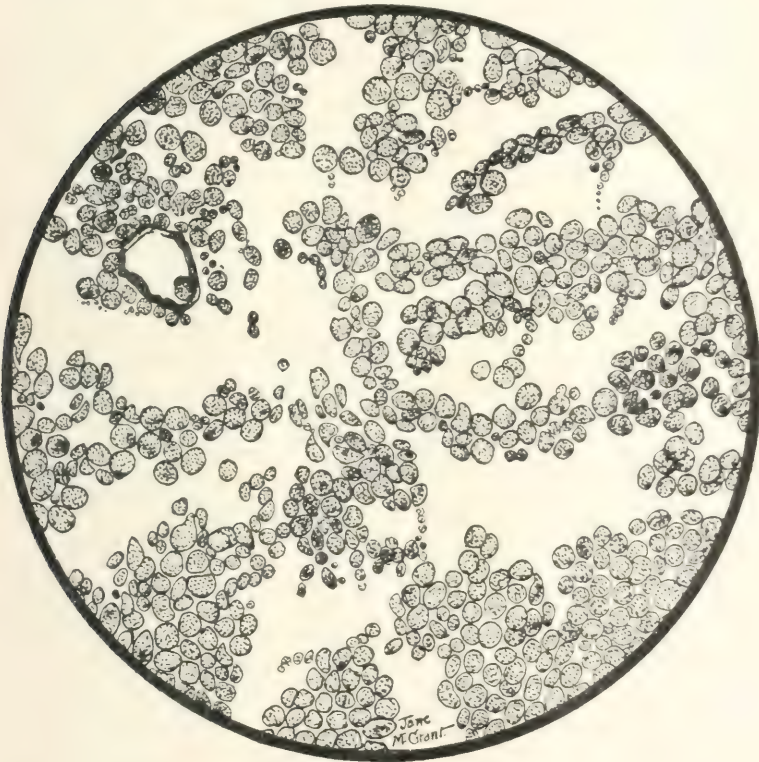


Fig. 6.—High power microscopic section of sarcoma of the chorioid-cellular area. (LeFever.)

CASE 1.—Miss M. R., aged 45, first seen on Sept. 17, 1903, had worn glasses six years. No history of injury or previous inflammatory condition of either eye.

She complained of not seeing well with the left eye for about one year. The external appearances were normal. In the right eye the media were clear. There were several areas of chorioidal degeneration along the course of the inferior temporal vessels. In the lower temporal quadrant, down and out from the macula, there was a rounded gray elevation about 3 mm. high and the same width, with

sharply defined outline. The inferior temporal vein on approaching the growth was lost from sight, reappearing at a point higher up and crossing in a very wavy line. V. 20/cc. A diagnosis of probable sarcoma of the chorioid was made and enucleation advised if any further growth and loss of vision occurred. In March, 1906, V. 5/cc, no general detachment, but the elevation was not so rounded on the top and best seen with 18 D. On Nov. 19, 1906, the retina was completely detached. No perception of light. Enucleation was now consented to and performed. There has been no recurrence. See illustrations.

CASE 2.—W. B. O., aged 61, first seen Sept. 11, 1903, had been wearing glasses twelve years. Patient thinks there was no difference in the two eyes after glassing until fourteen months before the date of visit. After that he noticed that the left eye was not as good as the right and gradually becoming worse. He had an attack of temporal neuralgia on the left side ten days before coming to the office. The eye had not become injected. There was no history of any other attack and no previous inflammatory history. His muscle balance was normal. Pupils normal.

Ophthalmoscope: R. E. media clear. Low grade senile degeneration of the chorioid. No other fundus changes. L. E., media clear. The macular region contained several yellowish-gray, irregularly-shaped areas occupying a space twice the size of the disc. Peripheral chorioidal changes the same as in the right eye. There was a compound hyperopia of three and one-half diopters in each eye. The fields were normal in outline for both form and colors and there were no scotomata. He smoked to excess—12 or 15 cigars daily—and was placed upon treatment for tobacco amblyopia. His urine was reported by the Philadelphia clinical laboratories to be normal. An attempt was made to get a picture of the condition presented by the left macular area, but he failed to keep his second appointment with the artist and the picture was never finished. At this time his vision with glasses was 20/xx in the right eye and 20/xxx in the left.

One year later, in September, 1904, vision in the left eye had decreased to 20/lxx. Fields still normal. Colors disturbed centrally. Island-like areas in the macular region more conspicuous, but no elevation or detachment of the retina. Treatment for toxic amblyopia continued.

Two years later, June, 1906, vision was down to 5/cc in the left eye. Media still clear. The mottling in the macular region was more marked, of which a note was made, but no elevation was discovered.

The patient was not again seen for more than a year, when Dr. E. S. Saylor reported, on July 17, 1907, that he had seen the patient first on May 1, 1907, at which time the retina was detached over more than half the fundus to the temporal side of the disc. The detachment was rounded like a ball, smooth and elevated about 6 mm. Media clear. No inflammatory symptoms.

When the patient was seen on July 17 there was light perception in the lower temporal field only, and the retina was almost completely detached. There was a history of an inflammatory attack, resembling secondary glaucoma a few weeks before.

Enucleation was advised and performed under local anesthesia on September 9. At this date, June 1, 1908, the patient is in good health. (See illustration.)

CASE 3.—W. C. H., aged 54, first seen on Aug. 18, 1907, gave a history of beginning dimness of vision in the nasal field of the left eye about eight months before date and of having bumped the orbital rim against the edge of a half-open door six months previous to beginning loss of sight. There had been no external evidence of injury, but the eye had been uncomfortable for some time afterward. No examination was had. Failure of vision had progressed during the last eight months.

The patient was first seen in a distant town with no facilities at hand for recording visual acuity, but there appeared to be present the ordinary peripheral acuity of the nasal retina, with about two-fifths of the nasal field entirely blind. The ophthalmoscope revealed a rounded black mass in the temporal fundus a little below the level of the macula and involving the macular area to within 2 mm. of the disc margin. There was no detachment of the retina, and a red reflex was obtained all the way around the tumor.

One month later the growth had encroached upon the disc and the peripheral rim of red reflex was more narrow. Other conditions the same as at the last examination, except that the field of blindness had increased. Enucleation was advised and performed on Sept. 19, 1907. At this date the patient is in good health. (See illustrations.)

TEAR IN THE RETINA. AN UNUSUAL OPHTHALMOSCOPIC PICTURE.

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(Illustrated.)

As the fundus condition which I am about to describe is unique in my experience and I have been so far unable to find a description or representation of anything at all similar in text-book, monograph or atlas, the title of this communication is more or less hypothetical, as there is no actual means of proving that there is an actual tear in the retina. The appearance of the fundus is, however, so striking and the picture so much in keeping with what would, theoretically, result in case of an actual rent that this inference appears justified; the more so, as no other assumption, such as that of hemorrhage or inflammatory exudation, would satisfy the ophthalmoscopic conditions, as will be shown in detail later on. The clinical data of the case are as follows:

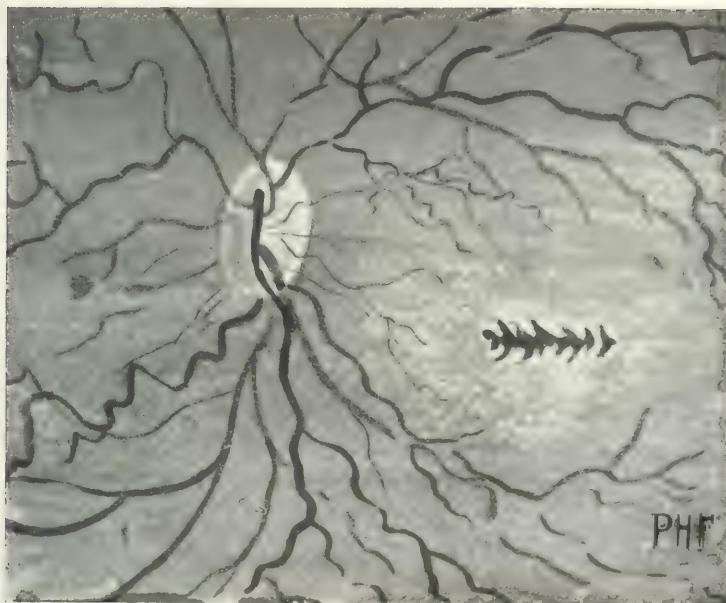
Morris L., aged 18, was referred to me by Dr. Edwin Sternberger on Jan. 26, 1908. The patient,¹ clerk in a downtown office, complains of poor sight. There is nothing of importance in the family history, but the patient's father, who is slightly myopic with good vision, says that the sight of his left eye suddenly failed when he was about the same age, viz., 18, and got better again in two or three years.

The patient always saw well at school and wore no glasses. Two years ago, after severe exertion in swimming, the sight of the left eye became markedly affected. Within two weeks it had failed almost completely. There was no pain in the eye, and no external irritation or other evidence of disease, and vision has remained bad ever since.

Physical Examination.—O. D. V. = 20 l — 20 xx, with sph. — 1 D. \ominus cyl. — 0.5 D. ax. 180°. Fundus normal, except that there is a barely perceptible pallor of the temporal half of the disc and a suggestion of a myopic crescent. O. S. V. = movements of hand at 2 feet (except in nasal half of field). Good light perception and correct projection in entire field.

Fundus.—Disc and chorioidal ring seen clearly with sph. — 3 D. or — 4 D. Entire retina soggy, jelly-like, and raised about 3 D. above the level of the disc. The usual stippling due to retinal pigment is conspicuously absent. All the vessels, veins as well as

1. Presented at a meeting of the New York Ophthalmological Society, Feb. 10, 1908.



Tear in the retina (Fridenberg).

arteries, from the largest branches to the smallest twigs, are abundantly tortuous, and the entire surface of the retina shows a faint but unmistakable haze with increased light reflex, suggesting the frosting or icing of a cake. In some places this homogeneous surface reflex is broken up into small round areas, suggesting the variety of leather known as "pebble-goat" or shagreen. There is no marked edema or milky opacity at any point, nor is there a trace of chorioidal vessels or of the usual chorio-capillary tapestry to be seen. The disc shows a slight atrophy affecting a physiological excavation, and there is evidence of myopic traction expressed in the rectilinear stretched course of the vessels running over the temporal half of the optic papilla. In the macular region, somewhat below the fovea, there is a spindle-shaped area, about 1 P. D. by $\frac{1}{4}$ P. D., with the greater diameter horizontal, with sharply-defined, ragged, "frayed" edges, in which a very bright red tone appears. This area shows absolutely no trace of the grayish haze and shagreen reflex mentioned above, so that it contrasts markedly with the rest of the fundus, suggesting the red spot seen at the macula in embolism of the central retinal artery and in commotio retinae. There is no trace of the chorioid to be seen in the denuded area or of pigment granulation or inflammatory products of any kind. The appearance of the tear, for such I assume it to be, suggests a raw blister of the skin surrounded by the whiter epidermis. There is no sign of hemorrhage here or anywhere else in the fundus, and particularly no sign of pigment deposit in retina or chorioid. The red area is not at all striking and can hardly be seen by indirect ophthalmoscopic examination. On close examination it is found that the tear is bridged near its temporal extremity by a small strand of retinal tissue so that it is divided into a large and small compartment. The fraying of the border is particularly noticeable and marked at the end nearer the disc. These frayed edges curl up very slightly so that when the ophthalmoscope is turned very much to one side so as to bring this area into the shade the frayed edges alone catch some light and appear bright. This appearance is very striking. Examination of the fundus on several occasions at intervals of a week or more showed no change in the condition described.

The hypothetical diagnosis of retinal tear depends on certain facts in the previous history, on the ophthalmoscopic picture, and on the analogy of fundus conditions suggesting the one described. We may assume that the original lesion was a retinal detachment, probably without chorioiditic exudation, as there is no trace of pigment proliferation or of newly-formed connective tissue beneath the retina. Either the amount of serous fluid which exuded was small, from the first, or it was absorbed or possibly escaped through the rent now visible. At all events, there is no gray-green reflex indicating a fluid accumulation or deep detachment at any point. The total absence of vitreous opacities, and the fact that the edges of the tear are in almost immediate contact with the underlying

edges, speaks against there ever having been such an escape of fluid quantity. These layers seem to be composed of retina, so that it would appear that we have to deal more with superficial tear or denudation than with a complete tear through the entire thickness of the retina. The ophthalmoscopic picture leaves no doubt as to the presence of an extensive flat detachment. This is strikingly shown by the absence of stippling, the tortuosity of small vascular twigs, the surface haze of jelly-like reflex, and the difference of level determined by the ophthalmoscope. Haab² pictures a tear in a detached retina, but the appearance is quite different from that described above. The torn portion has a characteristic grayish-green hue and protrudes well into the vitreous. The condition known as "hole at the macula" again is similar in name only, as it has never, to my knowledge, been observed in detachment, or, in fact, except in cases of injury to the globe, generally as a result of retained foreign body, or as a sequela of commotio retinæ. In this class of cases the "hole" appears punched out, with perfectly round, sharply-cut edges, and what is very striking, reveals in the depths an area of chorioiditis with atrophy and pigment proliferation corresponding to the retinal lesion. This is not an actual hole, at least in some cases, as microscopic histologic examination has shown that the hole corresponded to an area of retinal atrophy enclosing a cystic space filled with fluid. In my case the ophthalmoscopic picture shows beyond a doubt that there is solution of continuity involving at least the superficial layers of the retina. The ragged edges, frayed out to ribbons, speak very decidedly for such an interpretation. For an explanation of the pathogenesis of such a tear we are again reduced to hypothesis. There may have been a small local accumulation of fluid in the superficial layers of the slightly detached and edematous retina, which finally made its way through the few thin layers remaining between it and the vitreous, and escaped into the interior of the globe. Such an amount of serum might easily be absorbed without leaving any trace in the shape of vitreous opacities, nor would it escape with sufficient force to displace the retina immediately surrounding the tear, or even greatly evert the edges of the tear itself. It is remarkable that the retinal edema and flat detachment should have persisted so long unchanged and uncomplicated.

2. Atlas of Ophthalmoscopy, 1895 (Fig. 48).

A SMALL SARCOMA OF THE CILIARY BODY SHOWING SOME UNUSUAL MANIFESTATIONS OF MALIGNANCY.

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BOSTON.

(Illustrated.)

The following case presented a number of features so unusual that it has seemed well to place it on record. The clinical history of the case has been kindly placed at my disposal by Dr. Quackenboss:

C. G., male, aged 65, admitted to the Massachusetts Charitable Eye and Ear Infirmary, service of Dr. A. Quackenboss, Oct. 10, 1907. Patient states that nine months ago he discovered that the sight of the left eye was almost gone. Six weeks ago he was attacked by severe pain in this eye, which has persisted. Examination shows the eye moderately congested, the conjunctival veins being especially injected. At the inner limbus the conjunctiva shows a small slightly elevated area, dark-brown in color. The cornea is hazy, insensitive, and its posterior surface is covered with deposits. At the bottom of the shallow anterior chamber there is a deposit 4 mm. high, composed of blood and yellow material. The iris is swollen and hyperemic; the pupil moderately dilated and irregular. Lens cataractous, no red reflex obtainable from fundus. Tension +. V. O. S. *nil*. Right eye apparently normal. V. O. D. 20/xxx.

Owing to the constant pain and the possibility of an intraocular growth suggested by the dark elevation at the limbus, enucleation was performed the following day.

Pathological Examination.—The globe is normal in size and shape. The cornea is cloudy, especially in the center. At the inner limbus there is a round, almost black spot, slightly elevated, which measures 2.5 mm. in diameter. The anterior chamber is filled with coagulum (after fixation). The root of the iris is firmly adherent to the ligamentum pectinatum all around. There are no posterior synechiæ, but the pupil, 3 mm. wide, is blocked by a delicate membrane. The lens, 4.5 by 9 mm. in size, is cataractous. The vitreous humor before fixation is normal in consistency, but shows one small track of blood anteriorly and is slightly turbid. After fixation it is coagulated, showing a high albumin content. The retina and chorioid are *in situ*. There are no retinal hemorrhages. The disc shows a glaucomatous cup about 1 mm. deep.

In the upper outer quadrant of the globe there is a small, perfectly black globular tumor attached to the ciliary body just posterior to the ciliary processes. It measures 3.5 mm. in greatest diameter and its greatest height is 2.5 mm. Its base is 2 mm. in diameter and reaches no nearer than 3 mm. to the ora serrata. The body of the tumor projects for a considerable distance over the base anteriorly, coming in contact with the ciliary processes and with the posterior surface of the lens.

Histological Examination.—Fixation in Zenker's fluid. The tumor of the ciliary body (Fig. 1) is found to be a densely pigmented round-cell sarcoma. At its base it has directly invaded only the inner layers of the ciliary body, but has infiltrated the latter extensively. Almost all of the growth above the surface is completely necrotic, the necrosis being so marked that only here and there can the nucleus of a cell be recognized. The blood vessels in this portion are filled with stagnant blood, the red corpuscles staining feebly or showing disintegration. At the base, however, the tumor cells stain normal. The tumor proper shows very little stroma and possesses no capsule, being covered directly by the vitreous humor. No pigment is found in the tumor that is not readily bleached by the method of Alfieri. At its periphery the unpigmented layer of the pars ciliaris retinae has in places grown over the surface of the tumor and in other places has penetrated for a considerable distance into it.

The black tumor situated at the limbus (Fig. 2) is also found to be a round-cell melanotic sarcoma, but is much less pigmented than the tumor of the ciliary body. It replaces the episcleral tissue and is attached directly to the sclera. It is not covered directly by the conjunctival epithelium, but is separated from the latter by a variable amount of connective tissue. The tumor cells are large, round or irregular in shape, and their nuclei are vesicular with deeply staining nucleoli. Many of the cells are multinucleated. Almost all of the cells contain some pigment, but cell groups and single cells occur which are densely packed with it. Typical branched chromatophores are also met with. The pigment is light brown in color, occurs in both fine and coarse granules, and is readily bleached by the method of Alfieri. The stroma consists of a delicate connective tissue reticulum running between the individual tumor cells. There is no definite alveolar structure and no tendency for the cells to group themselves about blood vessels. No hemorrhages or areas of necrosis are present. Mitotic figures are abundant.

At the periphery of the epibulbar growth the tumor cells infiltrate the surrounding tissues and in places form discrete nodules. Within the underlying sclera numerous groups of tumor cells, most of them pigmented, occur both along the vessels and in the clefts of the sclera. Serial sections through the middle of the epibulbar nodule, however, fail to show continuity of growth with any of the intraocular metastases to be described. In one section a group of tumor cells are seen proliferating into the lumen of a vein.



Fig. 1.—Photograph of section passing through middle of base of tumor. Actual size.

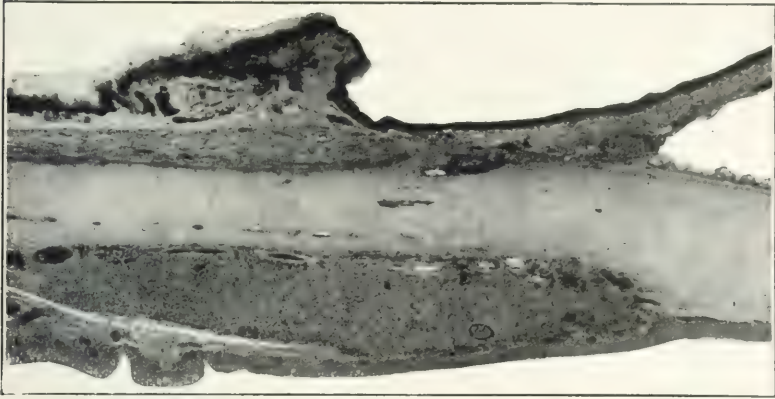


Fig. 2. Photograph showing epibulbar metastasis and metastases in filtration angle. X 45.

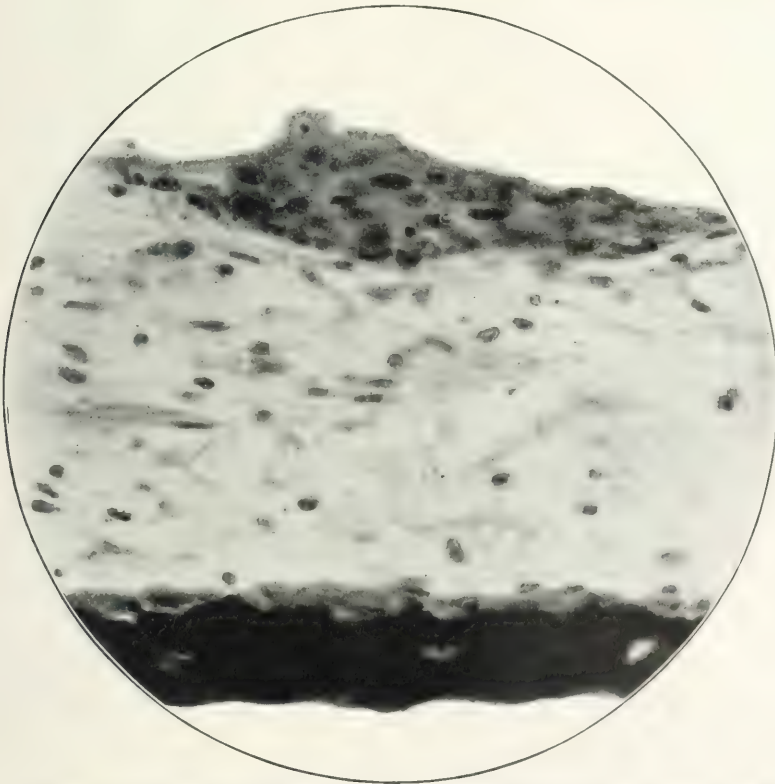


Fig. 3. Photograph showing implanted metastasis on surface of iris. X 410

In the center of the cornea Bowman's membrane with three or four lamellæ of the stroma are replaced by non-vascular scar tissue. At the periphery all around new vessels, accompanied by very little connective tissue, have penetrated a considerable distance from the limbus between the epithelium and Bowman's membrane, forming a pannus degenerativus. At the temporal side there is a well-marked pinguecula, and on this side the corneal stroma shows a slight infiltration with pus cells. Descemet's membrane and the endothelium are intact, but the latter has numerous clumps of cells adhering to it. The clumps are composed partly of pus cells and epithelioid cells and partly of deeply pigmented cells, apparently tumor cells. In some sections, Descemet's membrane shows a double layer at the periphery, lying between the two lamellæ of which are a row of pigmented (tumor) cells.

The iris is atrophic and has formed a thin pupillary membrane which is adherent to the lens capsule. On the anterior surface of the iris clumps of tumor cells are met here and there, some of which have grown into distinct nodules elevated above the surface (Fig. 3). Others have invaded the iris tissue instead of proliferating upon it. Some of the clumps are highly pigmented, while some are only slightly so. Several nodules are also found on the posterior surface of the iris near its root. The periphery of the iris is firmly united with ligamentum pectinatum and membrane of Descemet. Along the line of adhesion small groups and masses of tumor cells can be seen all around in almost every section (Fig. 2). Often also the spaces of Fontana are found infiltrated with tumor cells. The canal of Schlemm is distended with blood, as are also many of the spaces of Fontana.

The ciliary body is highly atrophic. Adherent to its surface, especially below, are numerous tumor cells, most of which are deeply pigmented. Similar cells are also found free in the vitreous humor in considerable numbers. The lens shows proliferation of the capsular epithelium and cataractous changes in the cortex.

The chorioid is normal. The retina is atrophic, the multipolar ganglion cells having entirely disappeared, and shows marked gliosis. The rods and cones are apparently normal. At the ora serrata the retina shows cystoid degeneration. The retinal vessels show no marked changes.

The optic disc shows a deep glaucomatous cup lined by a thin layer of neuroglia, which is continued as a still thinner layer over the retina internal to the hyaloid membrane. There is a slight interstitial hemorrhage within the disc. The nerve stem is completely atrophic. Serial cross-sections show marked endovasculitis of both central vessels. At the base of the optic excavation the vein is narrowed to one-half its normal size, while the artery is completely occluded. Less marked endarteritis is also observed in some of the posterior ciliary arteries.

No metastases are found in the posterior part of the eye, although pigmented tumor cells are to be seen in the meshes of the zonule as far back as the ora serrata.

Diagnosis.—Melanotic round-cell sarcoma of ciliary body. Metastatic epibulbar sarcoma of corneal limbus. Multiple implanted secondary growths involving iris and filtration angle. Secondary chronic glaucoma. Complete obstruction of central retinal artery due to endarteritis.

REMARKS.

The unusual features of this case are the occurrence of intra- and extraocular metastases arising from a tumor of such small size, the character and situation of the metastases, the early occurrence of and the manner in which glaucoma was produced, the almost complete necrosis of the primary growth, and, finally, the complete obstruction of the central retinal artery.

That the tumor of the limbus was secondary to that of the ciliary body seems clear from its much smaller size and its greater activity as evidenced by the greater number of mitotic figures, the more numerous multinucleated cells, and the less degree of pigmentation of the individual cells. In addition to this is the fact that there is no case on record in which so small a tumor as that of the limbus gave rise to intraocular metastases. The history of the case throws no light on the matter. That the sclera was found infiltrated beneath the epibulbar nodule loses any possible significance from the fact that the infiltration could have taken place from within. The situation of the epibulbar metastasis is also unique, the primary tumor of the ciliary body being situated in the upper outer quadrant, while the epibulbar nodule occurred at the inner side of the cornea. The latter thus did not represent a direct extension from the primary growth as is usually the case when intraocular tumors give rise to extraocular growths. Moreover, it was apparently a true metastasis and not due to extension from one of the intraocular metastases, since serial sections failed to show such continuity. That the two tumors were independent is highly improbable in view of the intraocular metastases.

The glaucoma was evidently due to the deposits of tumor cells in the filtration angle. It is interesting, though apparently of no special significance, that at the time of operation the anterior chamber was completely closed off from the posterior chamber by a pupillary membrane. The marked necrosis of the tumor of the ciliary body is perhaps explained in this case by the pressure of the vitreous body, the effect of which was clearly apparent in the compressed condition of the tumor.

The advanced endovasculitis of the central retinal vessels is of considerable interest, since it seems to indicate that in many reported cases of obstruction of the central vessels the obstruction was not the cause, but the result of glaucoma, and probably dependent upon the increased blood pressure in the senile vessels due to the high intraocular pressure.

A SUGGESTION AS TO THE TREATMENT OF SYMPATHETIC IRIDOCYCLITIS.

PATHOLOGY OF THE UVEA OR TRACTUS UVEALIS.

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The iris and the ciliary body, from their richness in blood vessels and repeated anastomosis, bear some analogy to the placenta, the whole eye depending as much upon them for its nourishment as the fetus depends upon the placenta. The abundance of blood which the iris and ciliary body must contain in order to provide for the nourishment of the eye, increased still more by the effort of accommodation they are constantly submitted to, is accountable for the great tendency of this part of the uvea to become inflamed.

When both iris and ciliary body become seriously inflamed in consequence of a sympathetic iridocyclitis the exudate poured out by these tissues finds its way:

1. *Into the anterior chamber.*—Here part of the exudate is suspended in the aqueous, part is deposited as a fine layer upon the walls of the anterior chambers, and part sinks to the bottom to form there a hypopion.

If the exudate in front of the pupil becomes organized into a membrane (pupillary membrane) the pupil will be closed—*occlusio pupillæ*.

2. *Into the posterior chamber.*—The exudate here may cause either an annular adhesion between the capsule of the lens and the pupillary margin of the iris which shuts off the aqueous of the anterior from the posterior chamber (*seclusio pupillæ*), or an adhesion of the whole posterior surface of the iris to the anterior capsule of the lens with obliteration of the posterior chamber (total posterior synechia).

The exudate, besides filling the whole posterior chamber, is also freely deposited in Petit's canal and upon the surface of the ciliary processes. From here it may find its way to the back of the lens, which is thus enveloped by a thick infiltration of the exudate connecting to the sides of the ciliary body. When the lens, in consequence of this, starts to shrink the whole ciliary body may be drawn out of its place.

3. *In the stroma of both iris and ciliary body.*

4. *In the vitreous.*

These changes and the inevitable increase of tension consequent upon them will inevitably lead to blindness; but should any light at all be left after the first attack of inflammation is over, this, too, will be destroyed by fresh attacks of inflammation caused by the constant pulling on both iris and ciliary body, consequent upon the shrinkage of the exudate, and the natural effort of accommodation, as soon as the eye is exposed to the light.

Against this our treatment nowadays consists in the instillation of atropin to prevent adhesions between the iris and the lens. The fact is that the iris, on account of its infiltration, does not draw to the side, and when it does, more harm than good is sure to follow, since the ciliary body will have to take up the blood which finds no lodgment in the iris (Fuchs), not to speak of the glaucomatous complications brought about by the atropin. No wonder that with such a treatment the result is sympathetic inflammation and an inevitable total blindness.

According to the Science of Ophthalmology, sympathetic inflammation is a sort of *noli me tangere* with which the specialist is not allowed to interfere, and atropin constitutes, as I said, the whole treatment of this complaint. In my opinion this is too little indeed in a case where anything can be attempted, because nothing can be worse than total blindness.

The general surgeon has realized wonders since he has started to dare; why should not the ophthalmic surgeon dare, too? Is not the eye part of the body? In my opinion, sympathetic inflammation should be viewed in the same light as all suppurating inflammations of the body are viewed by modern surgery, and should be treated likewise.

My treatment is on this line and consists: Rest, blood letting, elimination of the pus.

Rest.—This is best accomplished by removing the lens. Its removal suppresses the accommodation forever, and the ciliary body is thus allowed the benefit of absolute rest. Besides, the lens depends on the ciliary processes for its nourishment, and its removal will go to relieve them of so much work; but there is one more reason for it: it suppresses the Petit's canal where the exudate, being shut off from the stream of the aqueous, is sure to become organized into membranes.

Bleeding.—A very large iridectomy will permanently deplete the ciliary body. This membrane, the iris, with its large surfaces, is

mainly responsible for so much exudate being poured into the cavity of the eye, and is also responsible for the existence of those two small spaces, the posterior chamber and the pupil, where the exudate shows a great tendency to become organized. The more of the iris comes out the better, even by the fact that the ciliary body needs effectively be relieved of its congestion.

Elimination of the Pus.—The fine meshwork of the ligamentum pectinatum, through which the liquids of the eye are filtered into the subjacent Schlemm's canal, in all cases of sympathetic inflammation is blocked:

1. By the fine layer of exudate which lines the walls of the anterior chamber.
2. By the fullness of the iris due to the infiltration of its stroma.
3. By the periphery of the iris being pushed against it in all cases of *occlusio* and *seclusio pupillæ*.
4. By the reckless use of atropin.

If Schlemm's canal is now laid open with an incision in the sclera, and practically the whole iris is cut off at its periphery, the filtration of the liquids will be restored to normal. Then the anterior and posterior chamber, Petit's canal, and also the spaces formerly occupied by the iris and the lens will be converted into one large cavity wherein the exudate of the ciliary processes floats, in almost twice as much the normal quantity of aqueous. What will become of this exudate? Within the cavity nothing is to be found that might favor its tendency to gather into membranes, no iris to rest upon, no small cavities such as the posterior chamber and Petit's canal to become organized therein, nothing but aqueous. Under the circumstances it is but reasonable to suppose that the exudate will be, so to speak, washed away by the aqueous through the all-round wide-open Schlemm's canal; but should part of it sink to the bottom of the cavity and form there a hypopion, this, too, could easily be removed with an incision which may be used as a drainage in the after-treatment.

If treated in this way, i. e., as an ordinary suppurating cavity, the inflammation may gradually spend itself away, leaving a fair amount of sight, as in the case I will report below. Of course, this treatment to be of any good should be resorted to at the earliest symptoms of sympathetic inflammation, although in some cases it may be tried even at a later period.

Tattooing of the cornea, I presume, can not be dispensed with at the end of some months.

Summing up, I suggest that practically the whole iris be cut away because its suppression:

1. Reduces the amount of exudate.
2. Depletes the ciliary body.
3. Lays open Schlemm's canal all round the sclero-corneal junction.
4. Does away with small cavities, such as the pupil and the posterior chamber, where the exudate finds favorable conditions to become organized.

5. Increases the amount of the aqueous, which is so useful to wash the exudate away.

The lens also should come out because its removal

1. Suppresses all effort of accommodation then and after.
2. Suppresses Petit's canal, another small cavity where the exudate is sure to become organized.

3. Brings in communication with the new large cavity those ciliary processes which otherwise would discharge their exudate into the cavity of the vitreous.

4. Increases the amount of aqueous, which is so useful to wash the exudate away.

The plan to be followed is rather a matter of personal taste; mine would be this:

First day, iridectomy, with a Graefe knife. The incision is carried all along the sclerocorneal junction, from side to side, more on the sclera than on the cornea, leaving a bridge of tissue at the top and bottom of the eye. The iris is cut all along this incision close to its base, leaving a bit of it (if it is not possible to remove it all) at the top and bottom of the eye. Needling of the lens, or better still, disintegration of its elements by pressing the cornea against the lens, either directly by the means of a spoon, or indirectly, through the upper lid with the thumb.

Next day, removal of the capsule and suction of the milkish lenticular mass, followed by a thorough washing of the cavity then and after, if required.

All the work may also be carried out at one time, if so desired. Internal and external medical treatment to suit the case.

I am sorry that in support of the above I have only the following case:

N. N., a female, met with an accident in the right eye. Six weeks after the accident she was taken to my surgery. There was no sight in the right eye, the iris was incarcerated in two places, a thick membrane was obstructing the pupil and a dirty yellowish

color of the sclera testified to the deep involvement of the *tractus uveæ*.

There was cataract in the left eye, and I was asked to remove it to give the poor patient sight.

Now, to interfere with an eye at a time when the sympathetic inflammation may be incubating is more than any thoughtful man would dare to do without thinking of it twice. And I thought of it for two days. I kept this patient under observation, but I could detect nothing that might warrant a diagnosis of sympathetic inflammation to be in or under way, nothing except a little sensibility at the top of the eyeball and a slight pericorneal injection hardly worth mentioning. Other symptoms, if present, were masked by the cataract and might be suspected, not detected.

I was hesitating, but my hesitation could not last long, since I had already planned in my mind what course to take. My plan was to operate at once; should sympathetic inflammation be present or under way, the operation might get the best of it, and if not, well, my patient would be no worse after the operation than she was before.

I explained to the patient that no good and much harm might come by waiting, and she agreed to everything I said.

I always use Kalt's method in my cataract operations, i. e., I apply a silk suture before making the sclerocorneal incision.

I find it also useful to remove the capsule soon after the incision is made, and to cut the iris (only when it is necessary) after the lens is out and the wound is closed.

In the present case the application of the suture, the incision, the removal of the capsule and that of the lens, all went on all right, but no sooner was the lens out than the eye became conic shape and so congested that I could clearly see the large blood vessels of the conjunctiva and the smaller ones of the tissues underneath running in a radial direction from the sclerocorneal junction to the back of the eye. The vitreous might escape at any moment, but on pulling upon the thread the wound closed and the whole eye resumed its normal shape. The prolapsing iris was then cut at either side of the suture close to the incision, a good half of this membrane being thus removed, leaving a very large black pupil.

The enormous congestion of the eye as soon as the lens was out, i. e., when the intraocular tension becomes considerably low, made it clear to me that sympathetic inflammation was already in, so I waited with anxiety and curiosity to see what bearing my operation would have upon it.

After three or four days of comparative rest, the symptoms of sympathetic inflammation asserted themselves in a frightful manner. Most serious of all was the injection. This was deep in character and extended uniformly to the back of the eye, as if the whole tractus uveæ were equally affected, the chorioid as well as the ciliary body.

The next symptom in severity was the lachrimation, which was profuse and spent itself away only after several months had elapsed.

The third symptom was photophobia, but this symptom never attained such high degree of severity as either injection or lachrimation.

Whether there was any exudation in the anterior chamber or not I could hardly say, the photophobia and lachrimation preventing a proper examination; but as far as I could see there was none except a few dots on the cornea, no hypopion to be sure.

The ugly look of the eye is what impressed me most unfavorably, so unfavorably, indeed, that after three or four weeks I gave up both hope and treatment. Yes, in despair of any good, I discontinued visiting this poor patient, and even told her relatives that whatever sight there might be in the eye she would lose it within a short time.

At the end of three months from the operation this patient came to my surgery, and I was not a bit surprised to see that there was good sight in the eye operated upon. The congestion was not much, yet both congestion and lachrimation were easily excited by the least effort to look at something. There was still that ugly look about the eye which had impressed me so unfavorably from the start, so I did not feel like changing my opinion as to the ultimate result of the inflammation. I prescribed glasses and told the patient to report herself from time to time.

Three months later I saw her again, and this time I could get a good view of the fundus: this was normal; vision $\frac{1}{2}$; congestion, lachrimation and photophobia almost none, yet it was evident that the eye was undergoing some change.

To-day, eighteen months after the operation, the condition of both eyes is as follows:

Right Eye.—The yellowish dirty color of the sclera is more accentuated and reminds me of a leaf off a tree. A secondary cataract is filling the pupil; no sight.

Left Eye.—This eye, which was white and bright at the time of the operation, now, too, is yellowish and ugly looking, yet not so much as its fellow. A previous small kerontoxon at the top now occupies fully one-third of the cornea and seems still to be advancing; the pupil is large and black, the anterior chamber deep and free from exudates with $+ 8.00 \text{ } \ominus + 1.00, 180. \text{ V} = \frac{1}{2}$.

I consider this one of the most serious cases of sympathetic uveitis even by the fact that the right eye has not been removed, as it ought to have been from the start; when the inflammation affects more the anterior than the posterior portion of the tractus uvealis, the removal of both iris and lens should afford still better results.

In reporting this case in support of my suggestion as to treat-

ment of sympathetic inflammation I have only one desire: that my suggestion be applied without timidity, and that a copy of everything that will be said or printed pro or con be sent to me. I know that time only will show whether my suggestion will be of any good in the treatment of sympathetic inflammation and also other iridocyclitis, traumatic or otherwise, not amenable to medical treatment.

PRENATAL IRIDOCYCLITIS. BUPHTHALMOS.
INHERITED SYPHILIS.*

S. D. RISLEY, M.D.

PHILADELPHIA.

Katie H., a blind girl aged 15 years, tall for her age, spare of frame and a middle-grade imbecile but possessed of prodigious memory and strange fancies, has recently been discharged from the blind asylum, where she had been taken at my suggestion and admitted by Dr. Allen in 1902.

The medical history of this girl I deem of sufficient interest for your study, since it presents many striking features.

She came under my care on Oct. 10, 1893, as a private patient through the courtesy of Dr. Roland G. Curtin, who had then been the family adviser for twelve years. I am indebted to him for the following family history: The parents, born in Ireland, were then thrifty and living in a comfortable home and owned two houses as the result of their industry and thrift. The mother, a woman of excellent mind and a stalwart frame, had suffered four miscarriages occurring from the fourth to the seventh month of gestation, but syphilitic infection was stoutly denied by both the woman and her husband.

They were, however, both placed upon iodid of potassium and mercury. The fifth conception soon occurred and the antisyphilitic treatment continued faithfully by the woman throughout the entire period of gestation. She gave birth to a living, perfectly healthy child, which a few years later died from laryngeal diphtheria, never having manifested any signs of inherited disease. The iodid of potassium and bichlorid of mercury were, however, administered to both the man and the woman, and in due time a sixth pregnancy occurred and a daughter was born at full term, grew up to young womanhood, a sprightly, healthy girl. Supposing themselves cured they neglected both their physician and the treatment. A seventh pregnancy occurred, the product of the conception, born at or near term, being the subject of this sketch. When brought to me Oct. 16, 1893, she was a puny child, 8 months old, presenting well-marked specific facies, a skin eruption, stuffed nostrils and, so far as could be determined in so young and so wretched a child, ap-

*Presented to the Wills Hospital Ophthalmological Society, March 2, 1908.

parently blind in both eyes. The eyes were bad at birth. Inspection showed a completely annular synechia in both. In the right the pupil was occluded by a gray mass. The balls appeared small, even for her age, were soft, but the anterior chamber in each shallow.

A mercurial bandage was prescribed and worn continuously for many months. The general nutrition improved rapidly, the skin eruption vanished and the child grew and improved in health, losing much of the general syphilitic dyscrasia. The right eye remained blind, became hard, slowly enlarged and gradually took on the characteristic appearances of euphthalmos. In the left the anterior chamber was restored and the child obviously began to recognize light and notice moving objects, but the annular synechia remained. At 20 months of age she was admitted to the Wills Hospital, just one year after the mercurial bandage had been prescribed and during which time it had been worn continuously, so that the child had lived constantly in a mercurial atmosphere. There was then increased tension and recurrent attacks of ciliary injection, during which she was restless, often crying apparently from pain in the eye or head.

It was obvious that the eye, if undisturbed, would follow the history of its fellow and pass to the buphthalmic state.

Ether was administered and a successful iridectomy performed on Oct. 22, 1894. A broad coloboma was secured, but the lens capsule was gray and a dense rim of brown pigment remained at the site of the pupillary rim, where the iris had been firmly adherent. The eye recovered from the operation without notable incident. The recurring attacks of redness and pain ceased and the vision plainly improved. The right eye was totally blind and a source of constant trouble, often painful, continued steadily to enlarge until on Oct. 30, 1899, it was so prominent that the lids could with great difficulty be closed over it. She was again admitted to the hospital and the ball removed. It was found that the orbital fat had been largely absorbed, so that the enucleation left a yawning, empty socket, in which a large-sized glass ball was inserted, the muscles and conjunctiva made to enclose it, and was retained without difficulty. The eyeball measured 36 mm. in anteroposterior diameter. She was kept under frequent observation and more or less constant treatment until 1902. As she grew into young girlhood she could see her way about, count fingers and learned her letters on large play blocks.

The vision remained apparently stationary for about six years

and then steadily grew worse until in 1902 she could perceive shadows only. I then advised that she should be entered at the Pennsylvania Institution for the Instruction of the Blind at Overbrook, where she remained until December, 1907. With the deterioration of vision she became feeble-minded, but, as is quite common in imbecility, displayed some qualities of erratic genius which deceived some of her teachers. The institution reports of her school progress during the six years she remained furnish a sad picture of child life with its varying lights and shades. Her memory and vivid imagination were phenomenal and seem to have led some of her teachers to believe that she was a genius. For example, she would readily commit to memory long passages from Longfellow and other poets and for days afterward imagine herself the poet and enjoy periods of ecstatic delight, only to fall into succeeding petulance, irritability and deep despondency. Others report her as an unsafe pupil, a menace to both the physical and moral welfare of the other pupils. In a word, the school reports made by teachers entirely unfamiliar with the peculiarities of the feeble-minded, when interpreted correctly, placed her without difficulty in the category of middle-grade imbecility. Her parents started in life with bright normal minds and for a time seem to have lived thrifty normal lives. Nevertheless, through the baneful direct and secondary effects of syphilitic infection, they sank into poverty at last and the father died a drunkard and a syphilitic wreck.

Among the many points of interest in this unusual case are, first, the remarkable efficiency of mercury, as shown in the family history, in holding in abeyance, at least, the baleful consequences of syphilitic infection. Second, the doubt which it affords and which must ever be present in the mind of the medical man regarding the ultimate curability of syphilis. No sooner was treatment withdrawn in this unfortunate family after two healthy intermediate births, than the disease manifested itself in the ruined mind and body of this child. Third, the efficiency of iridectomy in saving some eyes from progressing buphthalmos if done sufficiently early.

While the vision after eight years was reduced to the perception of moving shadows, nevertheless the tendency to enlargement of the ball and the pain never returned after the operation.

HYPOPYON IRITIS, ASSOCIATED WITH EPIDEMIC CEREBROSPINAL MENINGITIS.

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MONTREAL, CANADA

(Illustrated.)

In a recent contribution on the ocular manifestations of cerebro-spinal meningitis Ballantyne¹ has shown that the occurrence of these manifestations are much more frequently the rule than the exception. Although the writer claims that in only four cases from a total of seventy-three examined were ocular disturbances absent, yet he states quite emphatically that in no instance was the iris or uveal tract involved. Oeller,² on the other hand, says that cyclitis does occur in cases of perineuritis which have originated from meningitis.

The condition is at least a rare one, and the present case should be of interest, not so much from a clinical standpoint as on account of the special bacteriological and pathological observations which have been made and which render the report more valuable.

C. W., an infant of two years, of foreign parentage, was admitted to the medical service of the Royal Victoria Hospital on April 4, 1907, its mother stating that it had appeared feverish and chilly. It had recently arrived from Europe and for three days prior to its coming to Montreal it had resided in New York. The voyage across the Atlantic had been uneventful, the child appearing in its usual good health and taking its food with apparent relish. The mother stated that shortly after her arrival in Canada the child was feverish and at times chilly and fretful. The personal and family history of the patient threw no light upon the diagnosis.

On examination a purpuric rash was seen to be distributed over the body, the child was restless and fretful, and the respirations were rapid. The child was fairly well developed, although there were definite manifestations of rickets present, as beadings of the ribs, enlargement of the wrist and ankle joints, and bowing of the legs. Some indefinite impairment of resonance was noted at the apex of the left lung anteriorly, and the glands were enlarged in the inguinal, maxillary and cervical regions. The heart sounds were rapid but fairly clear, the pulse was very small, running 140 to 160 per minute. A leucocyte count showed 41,600 per cm. The tongue was coated and dry, T. 101.4. The purpuric patches pre-

1. British Medical Journal, 1907, ii. p. 190.

2. Archiv. f. Augenkrank., vol. viii. p. 357.

viously referred to were somewhat irregular in shape and distribution, some being half an inch in diameter, others existing as mere spots. They were more numerous on the legs than on the arms, and on the arms than on the body. There seemed to be a definite tenderness present, the child strenuously objecting to being handled. It showed evidence of being able to speak and to hear and sensation was normal.

Two days later the child was quieter, but the respirations were somewhat more rapid, the purpura was more extensive, and a diffuse erythema had covered the body for about two hours. The blood on examination showed a preponderance of polymorphonuclear cells.

On April 7 the pulse was more rapid and weaker; T. 103°; there was little change in the condition of the lungs, but a distinct swelling of the right parotid gland was noted to-day for the first time; the purpura was more marked. A blood culture previously taken was negative.

On April 8 the condition was more serious, temperature remaining as last noted, both parotid glands were swollen, the pulse was very weak, and blowing breathing could be heard at the apex of the left lung posteriorly. The purpura was most extensive; a lymphocyte count showed 11,600. A lumbar puncture was made and one ounce of turbid fluid was withdrawn. Microscopically this showed numerous pus cells, but no micro-organisms could be detected. An infiltration of some of the superficial epithelial cells of the left cornea was first noted to-day, the fibers of the iris were somewhat swollen but an indistinct view of the eye grounds could be obtained. There was no perceptible change in the condition of the optic disc in this eye, and that belonging to the right eye was quite normal.

On April 9 I noted a marked condition of suppurative iridocyclitis. The iris was discolored a greenish yellow; it did not react to light, and the pupillary area and the anterior surface of the iris were covered by a plastic exudate of lymph. The lower angle of the anterior chamber was filled with bright yellow pus. The fundus of the left eye could not be seen; the fundus of the right eye was normal. Cultural growths of the cerebrospinal fluid made by Dr. Oskar Klotz gave positive results for the meningococcus of Weidenselbaum. The neck became more rigid, there was no apparent paralysis of the extrinsic muscles of the eye, and exerts occurred that evening.

A postmortem examination was made the following day when the eye was removed. The pathological diagnosis supported in the main the clinical observations which had previously been made; an acute purulent pericarditis occurring with the meningitis as well as the iridocyclitis were particularly interesting. Sections of the eye were made in celloidin varying from 20 to 25 micro. mm. in thickness. The stains I employed have been hematoxylin and eosin.

The macroscopic findings were those of a normal globe, except that the anterior chamber appeared to be occupied by a large quantity of exudate. The suspensory ligament of the lens also appeared to be the focus of considerable inflammatory reaction standing out in much bolder relief than is usually the case. The several coats of the eye were in close apposition to one another and the vitreous cavity appeared clear (Fig. 1).

The microscopical findings are as follows:

The superficial corneal epithelium is intact at both limbi and consists of the normal number of layers of cells; but as one proceeds inward these layers become perceptibly fewer in number, in

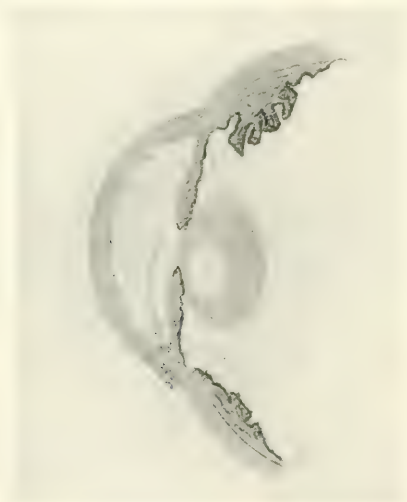


Fig. 1. Hypopyon iritis.

some places consisting only of one or two layers instead of several; in fact, at one or two points complete exfoliation of the epithelial layer has occurred. The cells, however, are all quite clear with deep nuclear staining, and the underlying hyaline membrane of Bowman is not shrunk or ruptured.

The underlying corneal tissue proper can hardly be said to show what one would understand as a definite infiltration, although one can make out several leucocytes scattered about through the tissue; these are mainly of the small mononuclear and polymorphonuclear variety. There is no contortion of the corneal cells. Descemet's membrane is intact, the nuclei staining unusually distinctly. Schlemm's canal is not occluded at either angle, nor is there any change in the lumen or about the walls of the vessels at the corneo-

scleral margin. The sclerotic shows little or no pathological change beyond a few isolated lymphocytes which are scattered throughout its fibers.

The retina shows a slight infiltration of its several layers of lymphocytes and some polymorphonuclears, but these cells are much more abundant in the layer of rods and cones and in the ganglion cell layer. Some of the retinal vessels have been cut transversely and their lumen is occupied with red blood corpuscles, a very decided infiltration of the vessel walls being noticeable in more than one instance. There is, however, no evidence of distinct engorgement. The cells about the walls of the blood vessels are mainly of the lymphocyte class. At the ora serrata this infiltration of the retina becomes much more pronounced, and in the pars ciliaris retinae, extending from the ora serrata to the ciliary body, the infiltration is so intense that the several layers of the retina can be detected with the greatest difficulty. At this point an enormous quantity of leucocytes has been thrown into the vitreous cavity which, with some organized connective tissue elements, follows the course of the retina up to the ciliary body.

The chorioid is practically normal; the chorioidal pigment as well as that belonging to the retina is intact; the vessel walls are normal and some of them are filled with a few isolated red blood corpuscles; they are by no means engorged. There is not the slightest indication at any point of perivasculitis, as I have already pointed out to have been the case about the retinal vessels. The optic nerve can hardly be said to be swollen, bearing out Gower's³ reference to Schirmer's examination of twenty-seven cases, where no apparent swelling could be detected clinically with the exception of one case. There does, however, appear to be a slight infiltration about the nerve fibers near the lamina cribrosa. There is no infiltration about the walls of the central vessels of the optic nerve. Some sections show an organized clot consisting of newly-formed connective tissue elements, some leucocytes and red blood corpuscles. I have considered this as a postmortem change, as there is no indication of a generalized marked engorgement of the retinal veins which would have resulted had a clot occurred in the central artery of the nerve during life.

The dural coat of the optic nerve sheath is normal, but the arachnoid consists practically of an infiltrated mass of lymphocytes and is firmly bound down to the pial sheath and the nerve trunk. The space existing between the dural and arachnoid sheaths is

3. *Medical Ophthalmoscopy*, 1904, p. 169.

practically clear, the exudate appearing to settle in the arachnoid coat itself as its seat of predilection.

The ciliary body is tremendously infiltrated with blood corpuscles, mainly of the small mononuclear and polymorphonuclear variety: these, with the pigment which is scattered throughout this structure, practically prohibit a clear view of the ciliary muscle. The ciliary body, like the pars ciliaris retinæ, has thrown an enormous quantity of these lymphocytes into the vitreous cavity which, following the course of the suspensory ligament, include the posterior capsule of the lens behind and the iris in front.

The lens is normal: some of its anterior fibers have been torn in cutting the sections.

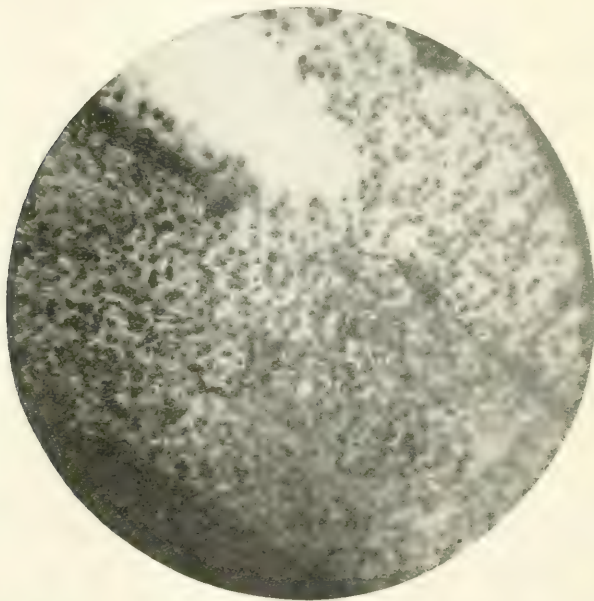


Fig. 2. Hypopyon iritis. Destruction of stroma cells of iris with marked infiltration of lymphocytes between the cells. Break up in the endothelial cells and subjacent pigment layer from which an enormous quantity of mononuclear and polymorphonuclear leucocytes is being poured into the anterior chamber.

The iris is practically a repetition of the condition noted in the ciliary body, but the degree of inflammation noted here is even more intense. It is tremendously infiltrated throughout its whole structure, its fibres are swollen and contorted, and the spaces between these are occupied by a marked engorgement of leucocytes, among which the polymorphs are very numerous. There are numbers of lymphocytes, a few large mononuclear leucocytes, and a number of erythrocytes. Inflammatory changes can be noted in

the posterior pigmentary layer, several pigment cells having become detached from adhesion to the anterior lens capsule as posterior synechiae. The anterior pigmentary layer can be seen to be broken at numbers of points where quantities of lymphocytes are pouring into the anterior chamber (Fig. 2). The condition of the vessel walls here is distinctly interesting; some of these capillaries are contorted and show a distinct swelling of their endothelial cells, numbers of which can be seen lying free in the lumen of the vessels. Again, one can make out occasionally a lymphocyte or polymorph in the blood stream, some adherent to the vessel walls and others evidently migrating through the walls of the capillary (Figs. 3 and 4). The capillaries of the iris are not engorged, al-

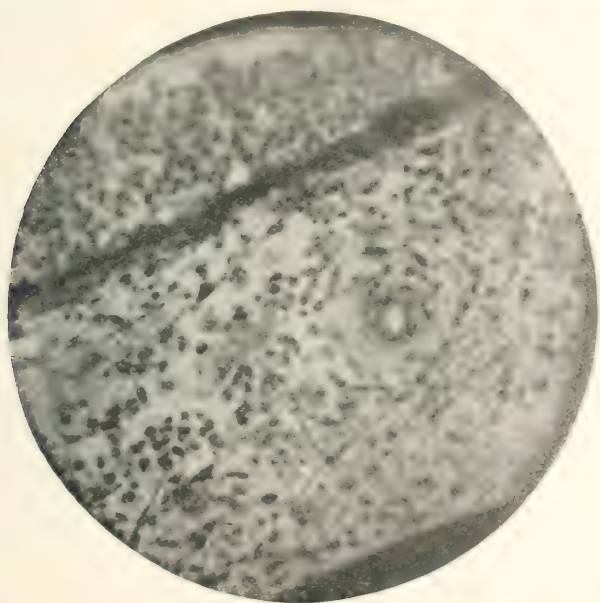


Fig. 3. Hypopyon iritis. Infiltration of iris tissue and dense exudate of leucocytes in anterior chamber. Swelling of the endothelial cells of a small blood vessel and an apparent tendency of the leucocytes to migrate through vessel wall.

though some of them contain a few blood corpuscles. Some pigment cells can also be seen scattered about the neighborhood of the vessel walls, and the connective tissue cells about these show a decided degree of inflammation. In the anterior chamber the lower filtration angle is completely occluded by a purulent exudate, which consists practically of a mass of polymorphs, lymphocytes and large mononuclear leucocytes, the polymorphs being by far the most numerous. A second mass of purulent clot follows this in a

wedge shape, apex down, extending upward as a ribbon-like band and covering the pupillary area. Organized connective tissue formation bounds the anterior part of this band, a second band of exudate extending over the whole of the anterior surface of the iris on one side, to which it is firmly adherent, and over one-third of the iris on the opposite side (Fig. 1). A large quantity of this exudate has been deposited on the posterior surface of Descemet's membrane, a comparatively small portion of this part of the cornea being discernible that has not a number of these lymphocytes in apposition to it.

Staining for Gram negative micro-organisms in the tissues is naturally unsatisfactory, more particularly when formalin has been employed in preparing the sections, and positive results were hardly



Fig. 4. Hypopyon iritis. Capillary of iris.

anticipated. I have stained some sections with carbol thionin and have found organisms in the exudate about Descemet's membrane and in the iris tissue, both intra- and extracellular, which might be taken for Weichselbaum's diplococcus. Their size was about what one might expect, but their shape and capsule was somewhat vague. They were scanty, although several could be distinguished with the aid of an oil immersion magnification. However, in the space between the arachnoid and the dural sheath of the optic nerve trunk, micro-organisms of a much more definite character were detected. These were of the usual diploid form, such as one finds in Weichselbaum's biscuit-shaped coccus, and were surrounded by a clear space very much the same as that found between the organism proper and its containing capsule.

In reviewing the literature on this subject one is struck with the paucity of cases which have been subjected to pathological study. Treacher Collins⁴ and more recently Sydney Stephenson⁵ have reported cases, but as Axenfeld⁶ very justly remarks, their investigations and subsequent conclusions can hardly be said to be complete, not having been able to exclude other forms of infection. Axenfeld had the same criticism to offer regarding the cases of Saltini and Silcock.⁷

A similar verdict may possibly be awaiting the present report; in its defence I may state that I consider the condition a metastatic form of inflammation, contending that the changes in the vessel walls of the iris and the migratory tendency of the leucocytes within the vessels support this theory. The fact that bodies were found in the tissues somewhat resembling the meningococcus and most closely resembling it in the arachnoid sheath of the optic nerve is a very strong point in my favor. That Dr. Klotz was able to isolate the meningococcus from the cerebrospinal fluid during life, added to the other features which I have presented above, should be sufficient evidence in substantiating my contention that my case has been one of acute purulent iridocyclitis of metastatic origin due to the diplococcus intracellularis meningitidis.

In conclusion I wish to express my thanks to Dr. Hamilton for his kind permission to examine the patient clinically, to Dr. Oskar Klotz for his report on the bacteriological findings of the cerebrospinal fluid, and to Dr. Adami for allowing me to remove the eye for pathological study.

4. Royal London Ophthalmic Reports, vol. xiii, part 3.

5. Transactions of Ophthal. Society of the United Kingdom, vol. xx, p. 121.

6. Bakteriologie in der Augenheilkunde, 1907, S. 335.

7. Transactions of Ophthal. Society of the United Kingdom, vol. xx, p. 112.

A RARE FORM OF COMPLICATED CATARACT.

WILLIAM ZENTMAYER, M.D.

PHILADELPHIA.

On May 5, 1907, there came to me at Wills Hospital T. O., female, aged 22 years. She stated that the sight of the right eye had begun to fail three years ago and had reached its present condition in two years' time. That of the left eye began two years ago, so that she has been practically blind for one year. Previous to three years ago she was near-sighted. The left eye had been operated on for squint when she was 13 years of age. The eyes had never been inflamed. Her general health has always been good. Both parents are said to have had good sight, although her father never wore glasses. Her mother died at the age of 48 and the father at 58. There are four children in the family. One brother, aged 25, has cataract (Case 2). The other brother and sister, aged respectively 27 and 30 years, are supposed to have healthy eyes. One maternal first cousin and one second cousin have been operated upon for cataract.

The patient is a healthy, strong, well-developed, intelligent woman. The corneæ are large, measuring 13 mm. in the horizontal diameter. The anterior chambers are unusually deep. The pupils are small but react to light. The irides are tremulous. The large and small circles are sharply differentiated in color, the larger being blue, the smaller brown. The structure of the iris appears atrophic and the stroma consists of converging straight lines entirely wanting in pattern. The scleras are bluish-white, porcelain-like, the right showing spots of sub-capsular degeneration. The candle field of both eyes is good.

On May 4, under holocain anesthesia, a discission of the right lens was made, the knife-needle entering the anterior chamber through the sclera. On opening the capsule a quantity of turbid fluid cortical substance welled out into the chamber. Eight hours after the operation glaucomatous symptoms developed, and as the patient was suffering severely the house surgeon (Dr. Briggs), under directions, performed a paracentesis. There was no subsequent rise in T. Ten days later a second discission was again followed by the escape of considerable semifluid lens matter. On May 25 a successful capsulotomy was performed. June 18, 1907, with -11 ± 1.25 ex 90° V. 20 xxx pt.

The cataract in the left eye was discissioned on June 7. There was the same character lens substance, but not quite so fluid as that encountered in the right eye. On the evening of the same day T. rose to $+3$, accompanied by severe pain. A paracentesis with evacuation of the cortex was done, but in twelve hours T. had again reached $+3$. The corneal wound was reopened and fluid

cortical and vitreous escaped. A recurrence of high T. necessitated a repetition of the above procedure twice in the next succeeding twenty-four hours. On June 18 the patient was discharged with a quiet eye. With + 11 D. \odot + 1.50 ex 90° V = 20, xl. There was no accommodative power in either eye.

On Oct. 29, 1907, T. O., brother of Case 1, came to Wills Hospital. He is 25 years of age, healthy, and had worked at harness making until eight years ago, when he first noticed that the vision of the right eye was much reduced, large objects only being recognized. One year later the vision of the left eye began to fail. Seven years ago the right eye was operated upon in New York.

In the right eye there is a small regular upward coloboma. A dense capsule occupies all but a small area at the outer column of the coloboma. The anterior chamber is very deep, the iris is tremulous but prompt to light in the inferior half, T. about normal. In the left eye the anterior chamber is very deep, the pupil small, iris tremulous and responsive to light stimulus. V. in O. D. motion of hand at 1 M. O. S. faulty, light perception. The cornea measures 12 mm. in the horizontal diameter. The irides present much the same appearance as those of his sister, but in some segments the trabeculae are visible. The scleras are bluish white, but not so porcelain-like. He was advised to have a needling operation on O. D. and a discission on O. S. An unfavorable prognosis was given. A triangular capsulotomy was attempted on O. D., but the flap remained in position. A third incision was carried across its base when the freed piece of capsule dropped back into the vitreous. Moderate reaction followed, which was controlled by continuous application of iced compresses.

On November 9 a discission of the left lens was made by the resident surgeon, Dr. Briggs. A milky fluid cortical substance flowed into and half filled the anterior chamber. Slight reaction with an increase in T. which never caused uneasiness followed. By December 3 complete absorption of the lens substance had occurred and a crucial incision in the capsule was made by Dr. Briggs.

The ophthalmoscope reveals no gross fundus changes. The anterior surface of the iris of O. S. is studded with cholesterol crystals. At present (Dec. 13, 1907), corrected V. in O. D. = 5 XXX; in O. S. 5 XXV.

S. R., aged 56 years, a first cousin of the above, was seen Oct. 10, 1907. Two years ago he noticed that he could not see well with O. S., which he attributed to having been struck in that eye by a piece of wood one year previously. With mydriasis the left lens showed a nuclear opacity with clear periphery, the right a beginning nuclear opacity, with diffuse opacities elsewhere. One week later a preliminary iridectomy with trituration of the anterior capsule was performed and two weeks subsequently the lens was successfully extracted.

M. R., aged 63 years, a first cousin of the preceding patient, came to Dr. Oliver's clinic at Wills Hospital in November, 1907.

He had bilateral senile cataract. The right eye was successfully operated on by Dr. Jones, through whose courtesy I am permitted to refer to the case.

In the April number of the *Archives d'Ophthalmologie* there is an article by Purtscher entitled "A Little Known Form of Complicated Cataract." He states that literature contains but one other than his own four cases of this variety of cataract. Three of his cases were in two sisters and a brother. The third patient was not related to the former family.

All of the cases presented in general the following characteristics: Scleras bluish-white, porcelain-like; anterior chambers very deep; irides a dull gray-brown, remarkable in being without the design of structure habitually visible in the iris, a marked differentiation in the large and small arterial circles, an irregular ectropia uvea; pupils small and sluggish to reflexes and mydriatics; a marked iridodonesis and fluid vitreous; predisposition to cyclitis and glaucoma and detachment of the retina.

He says that the hereditary transmission of the structural peculiarities above noted in several members of the same family presents nothing exceptional, but the circumstance that three brothers and a sister presenting these anomalies of structure developed the cataract at approximately the same age, 30 years, that two younger sisters having normal eyes have escaped cataract, and the observation of two other isolated instances, lead him to the belief that the cataract is secondary to the pathological alterations observed.

In the first patient discission was practiced on both eyes, there was subsequent increase in T. and the ultimate result in one eye was fingers seen at 30 cm., and in the other blindness.

In the second case preliminary iridectomy, extraction with wire loop. Ultimate V = movement of the hands at 1 M. Probable detachment of the retina.

In the third case the result was the same.

In the fourth case attempted extraction of the lens after preliminary iridectomy failed, the lens disappearing into the vitreous. Ultimate V. = 1/x. He thinks that preliminary iridectomy with extraction with the loop affords the best results.

The points of similarity between my own cases and those of Purtscher are so striking as not to call for categorical summary. The differences are that in my cases there was no ectropia uvea and the operative results were good. While a strong connecting link necessary to establish either the developmental peculiarities or the cataract as an hereditary condition is wanting, still the occur-

rence of precisely the same unusual anomalies in two members of the same family, in one branch of which there is an undoubted predisposition to cataract, would favor the view of an hereditary affection.

The arguments that Purtscher submits to sustain his views that the cataract is secondary to the pathological structural changes (which are probably hereditary) are supported by my cases, but as to the force of these arguments there may be a difference of opinion. Neither the non-occurrence of cataract nor the age coincidence preclude the possibility of the cataract itself being hereditary; in fact, by themselves they would rather favor that view. Being associated with anomalies of the uvea, it is quite reasonable to have expected that if secondary thereto they would have developed earlier and would have been of a different type; and in my own cases the good vision obtained would be against secondary cataract. However, I believe that Purtscher's opinion has much force and the above points are set forth as worthy of consideration in finally determining the question.

THE MANAGEMENT OF SQUINT.

A. A. BRADBURN.

SOUTHPORT, ENGLAND.

The term squint is misunderstood perhaps more than any other expression. A squint is simply a term used to express one of the visible evidences of a certain condition. Squint is not a disease, it is only one of the symptoms of, it may be, two totally different affections. Thus squint may be present as a result of defect in vision, as the result of a nerve lesion or muscular palsy, or as a reflex symptom of severe constitutional disturbance. Under such circumstances to name a disease by one, and not the chief, of its symptoms is both misleading and erroneous. Such unscientific procedure not only is evident in its nomenclature but is associated with the methods most commonly employed for its rectification.

The term squint then simply means a visible deviation from the normal position of the eyes, and forms but one symptom of a condition which may arise from various causes.

There are two chief varieties of squint, viz., paralytic and concomitant. In concomitant squint the eye which squints can be moved freely in all directions, whereas in the paralytic form the eye is limited in its movement in the direction in which its paralyzed muscle acts. This feature of limitation of movement easily differentiates the two kinds and separates them into two totally different affections. The one I wish to speak about to-night is the former, viz.:

CONCOMITANT STRABISMUS.

This name not only indicates the presence of a deviation of the optical axes, but also the following, viz.:

1. A difference in the refraction of the two eyes.
2. A deficiency in what is called the fusion faculty, and in addition there is nearly always found
3. A defect in the vision of one eye amounting to loss of all useful vision.
4. An inability to bring the deviating eye to bear directly on any object.

It is evident, then, that the presence of concomitant strabismus indicates a complex state of matters, the rectification of which requires scientific handling. Not only has the outward visible defect to be corrected, but also those shortcomings associated with the

vision. Thanks mainly to the teaching of Worth (with whom I had the pleasure of working for over three years), the treatment of squint has been completely revolutionized and put on a true scientific basis. For many years the only treatment adopted was that of haphazard operative interference, all the other factors being absolutely unrecognized, untreated and ignored. The period of promiscuous operating, with its train of dire results, produced a natural reaction which resulted in the no less harmful advice being given to parents to wait until their child had outgrown the deformity. This line of treatment is no better than the older operative measures. One might just as well expect a rickety or tubercular child to outgrow spinal or tibial curvatures by an untreated course of waiting. It is a deep-seated belief and a grave error to believe that any case of true squint can be outgrown if left alone. There are many cases in which a squint does disappear, but such is never the case in concomitant strabismus. A squint which disappears belongs to the class of orbital imbalances known as heterophorias, and in the commonly accepted interpretation of the word are not squints at all. If need be they can easily be distinguished by the presence of the fusion faculty which, as has been pointed out, is always absent or deficient in a true case of strabismus.

The correction and management of a case of concomitant strabismus lies quite as much in the hands of the family physician as in those of the ophthalmic surgeon. Moreover, as the defect in vision sets in at an extremely early age, any delay in remedying and overcoming it will be productive of the most serious consequences. The fusion faculty, on which so much depends for success in treatment, can not, except in rare cases, be awakened or developed after 6 years of age. The same applies to the recovery of vision in the deviating eye. Under such circumstances delay in commencing treatment means loss of the most valuable time: in fact, in many cases means loss of all hopes of ever recovering either the fusion or visual faculty, and he who so advises takes upon himself a responsibility of the most momentous nature. Treatment, therefore, can not be commenced at too early an age. By this one does not mean that infants are to be unnecessarily encumbered with spectacles, but when such are imperative, 18 months old is not any too soon to give glasses. Statistics prove that most squints begin before or about 3 years of age and, unless training exercises are commenced before 6 years old, the chances of overcoming the defects in the eye and brain are very remote.

The technicalities connected with the types and varieties of strabismus would occupy too much time and space to enumerate here. Such are fully dealt with in the text-books. For the same reason no further reference need be made to the theories of squint, except to state that Donder's view that it arises from a disturbed relationship between the accommodation and convergence has been replaced by that of Worth, who considers it is due to a deficiency in the development of the fusion faculty. This defect is very frequently an inherited one. Breslau states that in 23 per cent. of his cases of convergent strabismus there was a history of squint in some relative.

The recognition of strabismus when present is not difficult. The two most reliable tests are the cover test and mirror test.

The Cover Test.—This can not be used in the case of very young children; in them the mirror test is the best. A piece of card or paper is placed over one eye, after the patient has been told to look at an object some distance away. If then the uncovered eye makes no movement, we know that this is the fixing eye. Now with a quick lateral movement we cover the other eye, and if this moves we know that it was originally squinting. If the eye moves out it is an inward squint—a convergent strabismus; on the other hand, if it has moved in, the eye was originally squinting outward—a divergent strabismus.

The Mirror Test.—This is the most satisfactory one to employ. The patient should be seated in a dark room with a lamp behind him. If an infant it can be held on a nurse's knee, who is seated as mentioned. A light is reflected from a retinoscopic or ophthalmoscopic mirror held in the hand at a distance of about two or three feet away. This will, when reflected into the eyes, immediately attract the attention of an infant, but an older patient will have to be told to look at the mirror. Reflected on the cornea of the eye will be seen a bright spot of light—the corneal reflex—and its position in relation to the pupil in each eye will afford evidence of any abnormality in the position of either eye. By interposing a card as a screen in front of the straight eye we note whether the deviating eye moves to look at the mirror, thus we learn in addition to the presence or absence of what is called the power of central fixation. If the patient can not fix the mirror with the deviating eye when the other is screened, we know that the eye has become blind from non-use, a condition called amblyopia exanopsia. By covering up each eye separately and getting the patient to look in various directions, we can ascertain what range

of movements each eye possesses. This latter test readily differentiates paralytic squint from other types.

The treatment or management of a case of concomitant strabismus is as much the duty of the general practitioner as that of other human ailments. Just as in other diseases, expert advice can be sought if desired for guidance in any difficulties which may occur, but for the carrying out of the treatment itself no special knowledge of ophthalmology is essential. Successful management demands care, attention and supervision for a long period of time, as it deals with the education of the visual organs of both the eye and the brain. For financial reasons alone very few can afford to receive this treatment at the hands of the specialist, and unless the family physician learns how to do it such cases will continue to remain uncorrected.

There are three main indications present in every case of squint which guide us in our management; they are:

1. To prevent the vision in the deviating eye from deteriorating and to restore it when defective.
2. To remove the cause by training the defective fusion faculty.
3. To remove the disfigurement by bringing the visual axes of the eyes into their normal relationship.

The means we possess for carrying out these indications are six in number, viz.:

(a) Correction of the refractive error so as to make the vision in each eye equal.

(b) Complete occlusion of the fixing eye so as to train the patient to use the deviating eye and restore its defective or lost function.

(c) Instillation of atropin into the fixing eye only until both eyes are equally used in fixing.

(d) Training of the fusion sense so as to teach the brain to blend into one stereoscopic picture the two images presented by each eye separately.

(e) Training the muscles of the eyes when any defect exists.

(f) Operation to assist removal of the defective position when it can not wholly be overcome by the above methods.

Except the first and last, all the other means come within the power of the family physician to carry out, whether possessed of special ophthalmic knowledge or not. When the surgeon is fully equipped by knowledge, experience and instruments, the correction of the refraction will also come within his province.

The indications and methods being thus stated, it remains then only to learn how such are carried out.

Investigation of any case of strabismus should be made along the following lines:

(1) *History*.—Under this heading we should inquire regarding the age of onset, how it began and any probable cause such as the preceding illness noted. Inquiry as to any history of squint in any member of the patient's family should not be omitted.

(2) *Nature of the Squint*.—Whether convergent, divergent, alternating, etc, the cover and mirror tests already mentioned being employed in determining which of these conditions is present.

(3) *The State of Central Fixation*.—This point can be ascertained by the mirror as already mentioned. If, when the straight eye is covered, the unscreened one moves so as to bring the corneal reflex into the center of the cornea, we learn that the power of central fixation is present, or, in other words, that the patient can still use the squinting eye for the purpose of seeing with. When the eye does not fix it has ceased to be used, and is in a condition called amblyopia ex anopsia, or blindness from non-use.

(4) *The movements of each eye separately* should be tested by screening one eye while at the same time the patient is told to follow the movements of the mirror or finger with the uncovered eye. In very young children some bright object, as a bunch of keys, should be used instead as of more interest than a finger or mirror.

(5) *The visual acuity* should be investigated. In older children the ordinary test type can be employed; in infants the use of small ivory balls is perhaps the simplest means. One eye is covered up at a time and the child told to pick up the balls from the floor, and according to the way he sets about getting them judgment of the visual acuity can be fairly accurately gauged.

(6) *The Refraction of each eye* is to be ascertained. For this purpose atropin 1 per cent. is instilled preferably in the form of an ointment three times a day for a week. Glasses are ordered at the end of this time of a strength to within half a dioptré of the full amount. While the patient is awaiting the glasses the mydriatic is instilled once a day only in both eyes so as to make it easier for the patient to become accustomed to the glasses gradually.

These outlines comprise the details of the first two visits. If desired the angle of the deviation can be measured by Worth's instrument, which is the simplest, or by Priestly Smith's method, or the perimeter.

All these details can be carried out, if desired, by an ophthalmic surgeon, and the case then referred back to the sender for further treatment, which will consist in carrying out indications 2, 3, 4 and 5.

(2) *Occlusion of the Fixing Eye.*—The idea aimed at here is to endeavor to make the patient use the squinting eye. In those cases in which central fixation is easily obtained it may only be necessary to instil atropin in the fixing eye, but in cases where it is very deficient it will be necessary to completely occlude the fixing eye. Frequently one sees patients going about with only a cap over the eye. This is a perfectly useless proceeding, as such patients learn to look out beneath the shade in preference to using the squinting eye. To be at all effective the eye must be covered with a piece of lint, which is held in position with strips of plaster. This occlusion is kept rigorously applied until we (by means of the mirror test) ascertain on taking off the cover that the originally squinting eye is used in preference to the other for *both near and far vision*. Such a result will naturally bring the deviation over into the other eye. The cover may require keeping on for a month or even longer at a time, it being taken off and the eye cleansed and reapplied weekly. Of course the correcting glasses must be worn constantly, the occlusion pad being placed underneath the spectacles. When we have succeeded so far in transferring the squint, we can leave both eyes open for a week and await results.

(3) *Instillation of Atropin into the Fixing Eye Only.*—This method is employed for the same purpose as the occlusive bandage. It is employed for those cases in which the power of central fixation is more equally distributed between the eyes. Thus it may, in appropriate circumstances, replace the occlusive pad, but is more generally required as a supplementive measure. We continue the instillation only just sufficiently long enough in the fixing eye to obtain fixation in the squinting eye. When this stage is reached, which is ascertained by the mirror test, the instillation is stopped for a week. Subsequent examination will reveal if either eye is preferred for fixation, and the instillation repeated in whichever eye is found to be the fixing one, until a state of matters is reached revealing an ability to fix with both eyes at will while both remain uncovered. We shall have thus succeeded in producing an alternating strabismus in addition to having restored the vision in the originally squinting eye. We are now in a position to train the brain to fuse the two images.

(4) *Training the Fusion Faculty.*—To carry out this part of the

treatment we require to obtain Worth's amblyoscope, which is by no means an expensive instrument. In the employment of this instrument we must bear in mind that we have to develop and build up the function of a center in the brain which is poorly founded. Were such not the case the occurrence of squint would not be possible. Further, the subjects we have to deal with are children, often of a highly sensitive and not too perceptive a nature. Their handling and successful management demand a combination of qualities in their teacher which unless possessed of, spell failure from the start. Such cases are, therefore, at times trying and call for great tact and perseverance, combined with firmness. However, as a rule children soon learn to take a great interest in the exercises, and progress once started is both rapid and gratifying. It is due to the absence of some of these essentials that the procedure has in some hands not been successful. The method is correct; failure is due to the operator.

To carry out the amblyoscopic training the little patient wearing his glasses should be seated opposite the surgeon and in front of his eyes is held the instrument. On either side are placed two lights which should be capable of being varied as regards their illuminosity. This can be accomplished in various ways, the simplest being to so arrange the lights that they can be brought nearer or moved further away from each end of the instrument.

Two of the pictures supplied with the instrument are then taken, one being inserted at either end. It is best to commence with those of the bird and the cage. When they are in position, and the lights adjusted so as to illumine each, the little patient is asked to state what he sees. If the picture of the cage is opposite the originally fixing eye, he will say that he sees the cage. The light which is illuminating this picture must then be reduced or even extinguished until the picture of the bird comes to be recognized by the other eye. Then by gradually increasing the illumination of the cage picture a stage will be reached when both pictures are recognized under equal illumination. All this means time and patience. The next step consists in approximation of the pictures by moving the tubes. At first as the pictures tend to coalesce the image of one picture will disappear. Practice and patience will in time overcome this until a stage is reached when the little patient exclaims that the bird has gone into the cage. At this stage we have obtained the simplest form of fusion or blending, and the condition can be strengthened by substitution of more and more complex pictures. So far we shall only have obtained fusion in

the position of the eyes as they were. We must next endeavor to obtain a maintenance of the fusion throughout a fairly wide range of movements. To obtain this end we move by small steps the instrument, endeavoring the whole of the time not to lose the blended picture. With practice it will be found that this is soon accomplished, until a stage is reached when fusion of two dissimilar objects can be blended and maintained as one picture throughout a very large arc of movement. Once this is fully obtained we have overcome for once and all the chief cause of the squint, and in many cases these measures will have succeeded in bringing into correct relationship the originally defective position of the eyes. Once a week or once a fortnight for half an hour at a time is quite often enough for these exercises. It has been found by practice that nothing is gained by being given oftener. One must not omit to mention that there are certain circumstances which preclude all possibility of ever obtaining a true fusion faculty. Such occurs in the type of true alternating strabismus, and in cases in which treatment has not been commenced before 6 years of age.

Up to this stage we have accomplished the following: We have made the vision equal in both eyes by glasses, restored the function of observation to the squinting eye by the occlusive bandage, and with the assistance of atropin adjusted the work of the eyes so that one is not employed more than its fellow. Lastly by means of the amblyoscope we have developed the receptive center in the brain, at first by obtaining simultaneous recognition of two dissimilar images approximating same by mechanical means until a superimposition leads to a true blending or fusion. Such fusion once obtained is cultivated until it can be maintained while attempts at separation are made by the instrument originally used for blending.

Such, then, is briefly Worth's principle of treating strabismus, and in the majority of cases of the convergent type, which is the commonest, no further interference is required. It is, moreover, sound in principle, scientific in theory and practice, and marks one of the greatest advances made in ophthalmology for many years.

There are, however, some cases which can not by these methods alone have the unsightly appearance of the squint entirely removed, and further improvement can be obtained by Maddox's instrument for strengthening the weak muscles, or by operation.

Maddox's instrument, which he calls a prism verger, is based on the principle of making the patient maintain binocular fusion while prisms are rotated in such directions as will necessitate the

bringing into action the defective muscles. Such exercises demand naturally that the fusion faculty should be completely developed, otherwise double vision would only too readily be obtained and our efforts nullified.

To use the instrument the patient should be seated at five or six meters away from a set of test-type. He should be told to maintain his attention on the smallest of the letters which he can read distinctly through his spectacles. The apices of the prisms are set in the instrument in the position which gives him binocular single vision: for an internal squint the apices of both prisms would be set inward, and for a divergent strabismus outward. By rotating a milled head the prisms are moved so as to cause the apices to rotate in the direction in which the movement of the eyes is defective. This for an interval squint would be outward, and in a reverse direction for a divergent strabismus. The rotation of the prisms is proceeded with slowly and gradually until a stage is reached when the patient declares that the letters are growing indistinct. A pause is then made while the patient by an effort of will obtains clearness of vision. Rotation is resumed and another rest given until a point is reached at which no further clearing can be obtained and the patient confesses to the presence of a doubling of the letters. Repeated exercises varying in time and frequency according to the requirements and results obtained in each case soon give evidence of brilliant results. In young patients at the beginning of the course of exercises no blurring of the letters may be complained of during a very extensive rotation of the prisms. This is due to the patient preferring the image of one eye to the other and not observing the doubling of the letters. The presence of such is easily discovered by resorting to the cover test. If either eye be covered by a card or screen when only one eye has been in use, a movement will take place in the uncovered eye. Had true binocular single vision been present, it is obvious no movement would be necessary on the part of this eye. Where this condition of affairs is present, resort must be had once more to the amblyoscope so as to train the maintenance of the fusion faculty. Finally comes the question of operation. This ought to be the very last resort, and not, as has been in the past, the first and most abused remedy. Here again just as much scientific improvement has taken place in the technic of the operation as has attended the pre-operative training methods. Haphazard severing of muscles is or ought to be as much a thing of the past as indiscriminate venesection. Before operating careful examination of the degree of deviation should be

made and steps adopted to ascertain how much is due to muscular inefficiency and how much to hypertrophy of the opposing muscle. For the former endeavors would be made to develop the weak muscle by appropriate prism exercises, and later its advancement with or without shortening could be done: for any hypertrophy we would have to choose between a partial central tenotomy or lengthening of the muscle according to one of the various methods now so well known. Under certain circumstances a combined advancement and tenotomy would be adopted. Simple tenotomy as a rule is seldom required, for not only does it entail a serious risk of falling back of the muscle with the more possible chance of leading to an opposite condition of the squint, but precludes any use being made of the cut muscle for operation at some other time. Again tenotomy by its effects on Tenon's capsule causes a protrusion to take place forward of the eyeball, which results very often in a most unpleasant appearance being given to the eye, and finally not only is the operation unscientific, owing to the uncertainty of its ultimate results, but it weakens the function of the visual apparatus, which may lead to serious results in later life.

AN ILLUMINATED SPUD.

ALBERT C. SNELL, M.D.

ROCHESTER, N. Y.

(Illustrated.)

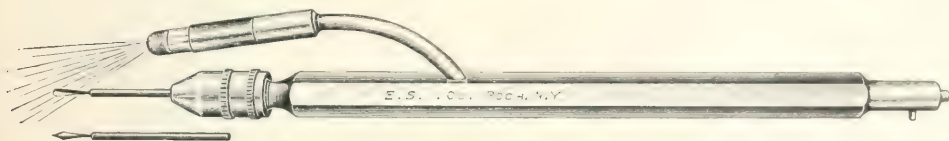
Most of the difficulties encountered in the removal of any foreign substance from the cornea of the eye are those which have to do with obtaining and maintaining proper illumination at the exact point of operation. In order to focus the light brightly on the object to be removed there is commonly used a four-inch condensing lens which is held at the proper focusing distance between the source of light and the object to be illuminated. The source of light is a fixed point while the area of illumination, the cornea, is a spherical, movable surface. When these three factors—source of light, condensing lens, and illuminated area—are in their proper relation to each other a foreign body can be clearly seen. In order to accomplish this desideratum the patient's head must be turned in the right direction so as to bring that portion of the cornea in which the foreign body lies in the direction of the line of light, the patient must fix his eyes steadily on some object (being directed to keep both eyes open), and the surgeon or an assistant must hold the condensing lens steady and at the right focal distance. If the patient fixes his eyes as directed, if he holds his head perfectly still, if the condensing lens is held at the right focus, and if the spud, hand or arm does not get into the way or obstruct the light, it would be an easy procedure to remove a foreign body. But it is rare, indeed, when all these conditions exist. It is seldom that a patient can fix his eyes on an object, or hold his head still, while the surgeon digs out a piece of steel or other foreign substance from the cornea. Any movement of the patient's eyes or head, or of the condensing lens, throws the foreign body out of view and renders our efforts at removal futile.

Although the removal of a foreign body from the cornea seems to be a simple matter, every one who has done much of this work has had his patience sorely tried in his attempts to get the patient to fix his eyes properly and to hold his head as it is placed while the surgeon holds the condensing lens in one hand and a spud in the other. When we use an eye speculum to aid us we find the patient is still more difficult to control, and an assistant to hold the lids open is not always at hand. Under such circumstances we all have

wished for more than a single pair of hands and have found that the operation is not so simple as it at first appears.

However, with the use of the electrically-illuminated spud, herewith illustrated, most of these difficulties are eliminated. The source of light, the condensing lens and the spud are all incorporated into one instrument and thus require the use of but one hand, leaving the other free. The condensing lens-lamp is so placed that the area of focal illumination always lies in the center of the field of operation; that is, it is just in front of and surrounding the point of the spud; so that the proper relation between these essential factors—the source of light, the condensing lens, and the object—are practically fixed and invariable. The condensing lens-lamp is placed in front of the operator's hand so that nothing can possibly get into the path or into the field of illumination, and the light is always where the operator wishes it to be, no matter where the patient turns his head.

With the use of this instrument the operator may stand in any position he chooses, either in front of his patient or behind him, to



suit the surgeon's convenience. The patient may hold his head in any comfortable or natural position, and he may be placed either upright in a chair or in a reclining position on the office table as may be most convenient. A speculum is unnecessary, as the free hand may be used to hold the lids open.

I have found also that this instrument is very useful and convenient in performing a capsulotomy after cataract extraction, many of the same annoying difficulties being removed that are encountered in the removal of a foreign body from the cornea.

Briefly, then, the advantages of this instrument to the surgeon over the old method are:

1. The light is always exactly where the operator wishes it.
2. Nothing can get in front of the light to obstruct it.
3. The operator may choose any position.
4. Patient may rest his head in any comfortable position.
5. An assistant is unnecessary.
6. A speculum is not necessary.
7. Spuds can be removed from the handle for sterilization, or, in fact, the entire instrument may be boiled.

The mechanical advantages of this instrument are :

- a.* It is light in weight and well balanced.
- b.* Being hexagonal, the operator can get a firm grip.
- c.* By a chuck mechanism the spuds are securely held and can be easily removed from the handle of the instrument so that different forms of spuds or knives may be used.
- d.* The more expensive parts of the instrument are practically indestructible and the spuds or knives can be replaced when they become unfit for further use.

Many of these mechanical parts were suggested by the Electro Surgical Instrument Company of this city, by whom the instrument is manufactured. I wish to acknowledge my indebtedness to them for these favors and for the courtesies which were extended to me.

53 South Fitzhugh Street.

DIAPHANOSCOPY OF THE EYE.

H. V. WÜRDEMANN, M.D.

MILWAUKEE, WIS.

(Illustrated by one colored plate and 3 cuts.)

That the coats of the eye are translucent and that the globe may be illuminated and its anterior segment examined by a beam of light has doubtless been observed for a long time. Oblique illumination has revealed this to all of us, but the lighting up of the structures back of the iris by this method is so feeble in contrast to the superior illumination of the surfaces of the cornea, iris and lens that the value of such examination has not generally been recognized.

Diaphanoscopy is a method of lighting up the eyeball by passing a beam of light through it, somewhat similar to transillumination of the sinuses of the face, with the difference that a general lighting in all directions by a bare lamp placed in the mouth is used to the maxillary sinus for empyema, whereas the light is best confined to a beam for transillumination of the eyeball.

The discovery is usually credited to V. Reuss, that if a beam of light is passed sideways through the eye any opaque object, like an intraocular tumor situated in the anterior half, for instance about the ciliary region (which is not seen directly by ophthalmoscopic examination) would obstruct the passage of such beam and cast a shadow,¹ while the other parts of the eye remain translucent (see 13, colored plate). This use of diaphanoscopy has been described in a number of recent papers on the subject, mostly by German authors.²

Diaphanoscopy of the eye was at first restricted to the differential diagnosis of simple retinal detachment from that caused by intraocular growths. O. Lange claims to have used transillumination in 1884 by focusing light on the sclera by a convex lens for the differential diagnosis between intraocular tumor and simple serous detachment of the retina, and refers to this again in recent articles.

1. In diaphanoscopy for intraocular tumor the shadow across, or non-illumination of the pupil, is but a part of the effects of lighting up the eye; here the shadow is best observed on the outside of the globe, on the sclera of the opposite side.

2. Lange, Rochon-Duvigneaud, Von Reuss, Birnbacher, Gartner, Wolz, Leber, Sachs, Vuellers, Würdemann, et al.

Tumors of the iris and ciliary body can be seen by the external methods; those of the interior of the eye, in their first and second stages, occasionally by oblique illumination; some of us have seen intraocular tumors by this method. The shadow cast by them, however, has not been noticed until recently. In the first stages these growths may usually be seen by the ophthalmoscope, but the diagnosis may be corroborated in all stages by transillumination. In cases where the tumor is very thin or back of the equator this method is of no avail. Sachs and others added to these observations the additional use of the method for detection of chorioidal detachment and for examination of the eye by the direct method and to see the ciliary processes. The Purkinje figures are easily demonstrated in one's own eye by the method. The terminal vessels of the retina are beautifully shown.

II. Vueller³ has recently published a paper containing some observations in regard to the pupil similar to mine, but my findings have been made independently, before I was aware of his publication. He used the Sachs lamp. I am sure that the shape, size, non-heating qualities and full illumination of my model renders it preferable to any of the others.

INSTRUMENTS.

There have been a number of instruments devised for this purpose, both before and after I designed my model. The first was by V. Reuss, then came Gartner, Birnbacher, Rochon-Duvigneaud, Wolz, Leber and Sachs.

METHOD OF DIAPHANOSCOPY.

With all these instruments the method of examination is about the same. The room should be made very dark, or a hood put over the patient's and physician's heads, as has been recommended for x-ray examination by the fluoroscope. The tip of the instrument is placed on the lids, the eyes being open, or on the scleral conjunctiva, in the latter case the eye usually being cocainized. With the bulky and speedily heating instruments of Leber and Sachs the latter method is an unpleasant and awkward procedure, but with my pen-shaped instrument it is really unnecessary to cocainize the eye, for the application of the smooth end of the glass rod to the scleral conjunctiva is not at all disagreeable. My model may be used for ten minutes or more before it becomes too warm.

3. Neue, diagnostisch wichtige Resultate bei Durchleuchtung des Auges mit der Sachsschen Durchleuchtungslampe. Zeitschrift für Augenheilkunde, September, 1907.

The Leber instrument gets so hot in a couple of minutes that it will burn the skin, and the Sachs' does not stay cool even as long.

THE DIAPHANOSCOPE.

I may be pardoned for again giving a brief description of the transilluminator designed by me, as mine is so radically different from the others and has certain advantages. This instrument, which is now generally in use by ophthalmologists, is made mostly of hard rubber, weighs 30 grams, is 14 cm. long and 10 mm. in diameter, of the size and shape of an ordinary fountain pen, and is manipulated in the same manner. This instrument is now included in the DeZeng set (ophthalmoscope, skiascope and Würdemann transilluminator); a universal plug attachment fitting into the handle of each facilitates the interchange from one to the other. It consists of a handle, to one end of which the battery cords are connected; in the other end is a miniature *lens-capped lamp*, a very essential feature, for the illumination from this is three and one-half times that of the ordinary lamp, as all the light is conserved

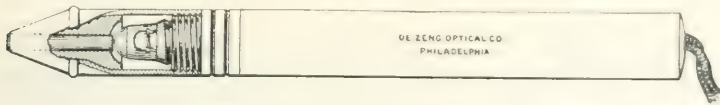


Fig. 1.—Author's transilluminator: 2/3 actual size. Diagram showing construction.

and reflected through the tip. Then comes a cylinder, in the end of which is a cone-shaped piece of hard rubber, through which passes a glass rod 2.5 cm. long and 5.5 mm. in diameter, which extends a fraction of a millimeter beyond the rubber tip of the cone. The inner end of this comes in contact with the lens-capped lamp, and thus nearly all the light made by the lamp is conserved and is projected through the glass rod, coming out of the cone as an almost parallel beam. It is claimed that this little instrument, with its miniature five candle-power lamp and needing less than one volt of electric current, gives as effective a light as the Brodingtonian apparatus of Sachs. Having so small a lamp and being made almost entirely of a slowly heating material, it does not get hot like other instruments, notably those of Leber and Sachs, which are made of metal. Then, again, these lens-capped lamps have a universal screw base and can be obtained from any electric supply house and are relatively long-lived and cheap. The adaptation of my lamp to the DeZeng set of instruments is a most convenient arrangement.

LIMITATIONS OF THE METHOD.

It must be remembered that the eyeball is so contained in the socket that a beam of light can only be sent through one hemisphere at a time, and, while we gain a little by rotation of the eye, yet fully a third of the back of the ball, necessarily including the nerve and fovea, remains impermeable. Therefore, this method only brings into light the anterior two-thirds of the globe, but it is evident that nearly all of the important structures of the eyeball are in the anterior third upon which the new method throws more light.

RELATIVE TRANSLUCENCY OF THE OCULAR STRUCTURES.

The effect of transillumination on the structures of the eye depends upon the degree of transparency or opacity of the tissues and varies in certain diseases from the normal. The cornea, aqueous, normal lens and vitreous offer little obstruction to light and are practically transparent. The conjunctiva, sclera, chorioid and retina are translucent; the normal iris and ciliary body are more or less opaque. Foreign bodies of stone or metal offer full obstruction to

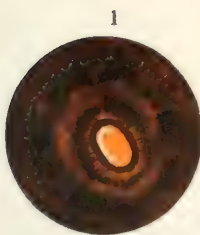


Fig. 2.—Author's Transilluminator.

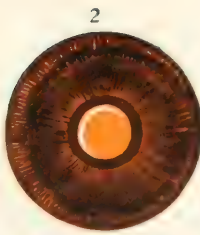
the rays, solid neoplasms are opaque and may be thus seen by direct view or their shadows observed; exudates are generally translucent, though purulent exudates are opaque. Fresh hemorrhages are somewhat translucent, old clots opaque. Cataractous changes show differences in the striæ, opacities in the vitreous as membranes give a similar effect and can thus be brought into view.

GENERAL APPEARANCES.

In an examination of the normal eye by transillumination the pupil will be first noted to be brilliantly illuminated; next we see that it is surrounded by a wide dark circular area, corresponding to the iris. This is a black ring in heavily pigmented irides, but in light blue or gray eyes the light comes through and the area appears reddish, with its texture and gross anatomy appearing quite distinctly (see Figs. 1 and 2 in colored plate). In medium-colored irides the markings are less distinctly seen. Next at the limbus we usually but not always observe the angle or root of the



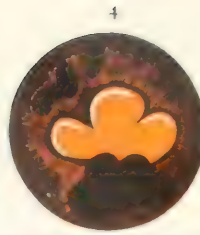
MEDIUM PIGMENTED-
BROWN IRIS, ESERIN
MYOSIS



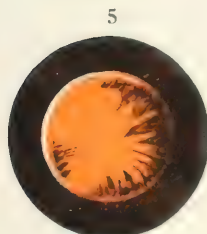
LIGHTLY PIGMENTED
BLUE IRIS



IRITIC SYNECHIAE
PIGMENT DEPOSITS
ON CAPSULE AND
DEHISCENCES



SYPHILITIC IRITIS AND
GUMMATA



PARTIAL CORTICAL
CATARACT



LAMELLAR CATARACT



ANTERIOR CAPSULAR
CATARACT



TOTAL OPACITY
OF LENS
SHOWING
NUCLEUS AND
SECTORS



CATARACT EXTRACTION WITH IRIDECTOMY, IMPACTION OF IRIS, CAPSULAR OPACITY AND DEHISCENCES



CATARACT EXTRACTION WITH GOOD IRIDECTOMY, PIGMENT DEHISCENCES



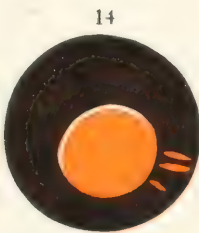
OCLUSION OF PUPIL WITH GREAT PIGMENT ABSORPTION AND THINNING OF IRIS



DOUBLE IRIDODIALYSIS. RIM OF THE LENS SHOWS PLAINLY



SHADOW OF INTRA-OCULAR TUMOR



RADIAL TEARS OF IRIS, TRAUMATIC MYDRIASIS



STEEL CHIP IN LENS WOUND IN IRIS



GLASS CHIP IN THE VITREOUS

IRIS AND PUPIL IN DIAPHANOSCOPY OF THE EYE.

Würdemann 1908

iris showing through the sclera as a dark ring, but not so dark as the iris that is seen through the corneal surface; this is surrounded by a fairly well lighted circular area, the circumlental space which varies in health from 1 to 3 mm. in width and may be lessened or entirely obliterated in glaucoma; outside of this is the shadow of the ciliary body and process and then towards the equator the posterior part of the anterior half of the globe which is next to the pupil most brilliantly illuminated, as the beam of light in the normal eye has little obstruction through the translucent sclera and clear vitreous. It is illuminated by white light, however, whereas the pupillary area shows a reddish glow from the retinal reflex, as it is also seen by ophthalmoscopic examination.

APPEARANCES IN DISEASE AND INJURIES.

If the light be obstructed by any opaque object, as pus or blood or a tumor in the eye, differences in illumination or shadows will be observed (13). If there be any holes in the iris, as additional pupils (polycoria), dialysis (12) wounds showing passage of a foreign body (15); these openings will be as brilliantly illuminated as the true pupil. Along the edges of the pupil or these openings opposite to the source of illumination there will be usually seen a reflex, which is the edge of the iris.

If there be any dehiscences of the retinal pigmentary layer of the iris, as follow after iritis (3 and 4), especially after a long-continued iritis with nearly or total adhesion to the anterior capsule of the lens, these spaces will appear illuminated nearly as brilliantly as the true pupil, but without the reflex at the edge before mentioned. This method of examination is especially valuable in cases where the pupil does not react to mydriatics or in grave posterior synechiæ, for valuable information may be given as to the best place in which to perform an iridectomy in a place where the iris is not adherent without danger of producing cataract. Total occlusion of the pupil is readily demonstrated (11); likewise is the opposite condition and its cause, i. e., a mydriasis following an injury where the existence of radial tears of the muscular structure and the pigmentary layer (14) are shown. The swelling, infiltration and neoplasms of the membrane in iritis and glaucoma are well shown (3 and 4). Thinning of the iris and detection of loss of pigment following these inflammations is demonstrated (3, 11). All forms of lenticular opacities are well demonstrated (5, 6, 7, 8). Information as to the location of tumors or foreign bodies behind the lens may be shown, as all

cataracts are made translucent by diaphanoscopy, the pupil appearing illumined, although not so bright as where the lens is transparent. In secondary cataract the different thickness of the various places is indicated by the brightness of the strata (9). One may be surprised to note the mechanical damage done to the posterior layer of the iris in an apparently perfect extraction or expression of cataract (10), which shows that the pigment layer is often scraped off by the surface of the lens or by instruments. But these dehiscences are of no great cosmetic or functional importance. They, however, show the traumatic cause or source of some of our cases of postoperative iritis.

In leukoma of the cornea the condition of the pupil may be elucidated by transillumination, for here, as in lenticular opacity, the structure is quite translucent. Foreign bodies in the iris and their course through the membrane, in the lens and sometimes even in the vitreous, may be brought into view and seen by this form of examination (15, 16).

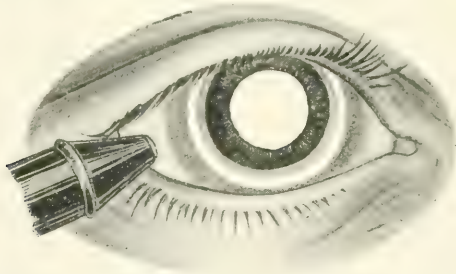


Fig. 3.—Diaphanoscopy of the eye showing the circumlental space. The pupil is moderately dilated, the root of the iris shows as a dark ring around the limbus, then a clear ring is seen, which is the circumlental space, surrounded by another dark ring caused by the shadow of the ciliary processes; outside of this ring the sclera is brilliantly illuminated. In the drawing the differences in illumination are slightly emphasized and the lighting of both sides of the globes are equalized. In practice the conditions are best observed on the opposite side to that which the tip of the transilluminator is applied. The drawing is semi-diagrammatic.

DIAPHANOSCOPY IN GLAUCOMA.

It was also discovered that diaphanoscopy was of considerable value for the detection of glaucoma, and in particular for the examination of the circumlental space. This method shows that this space is always smaller than normal in glaucoma, being even sometimes obliterated. An eye that is predisposed toward glaucoma has a small circumlental space.

For the past two years I have examined all cases of increased ocular tension that have come under my observation, and in a number of instances other members of the same family, by ocular transillumination, in hopes that this method would throw some

light upon the mechanism of glaucoma. In order to show the limitation of transillumination in this affection, I will first give a brief résumé of my ideas on the subject.

Glaucoma is not a disease *per se*; it is a condition, the most pronounced symptom of which is excessive intraocular pressure. There are two forms: anterior and posterior glaucoma.

(1) Anterior glaucoma may be acute or chronic, primary or secondary. The primary kind may be due (a) to increased secretion of the aqueous and increase of albuminous elements from congestion of the ciliary processes, according to Uribe y Troncoso and Leber; (b) sclerosis of the vessels, causing obstruction or closure of the iridic filtration angle. *Secondary* glaucoma may arise from previous iritic disease, causing obstruction of the filtration apparatus, or due to closure of the posterior chamber from posterior synechiæ. These conditions (a and b) are curable or alleviable by myotics or by the operations of iridectomy or sclerotomy.

(2) Posterior glaucoma—the chronic simple non-inflammatory type—is the second division and is due to obstruction of the vortical veins of the chorioid and diseased blood vessels, and is usually accompanied by general arteriosclerosis. This condition causes excessive pressure in the vitreous chamber and is mostly confined thereto. This form is not materially affected by any local treatment, be it myotics or operations, with the possible exception of the high tension faradic and galvanic electricity and ocular massage, with treatment directed toward toning up of the general circulation.

A mixed type is due (a) to intraocular tumors, which from their growth and consequent intraocular pressure produce obstruction of the anterior and posterior drainage apparatus; (b) so-called hemorrhagic glaucoma, usually due to subchorioid hemorrhage, which produces the same, and for these two conditions enucleation is the only resort; (c) increased intraocular tension following injury to the lens which causes it to swell and press upon the anterior filtration apparatus, obliterating the circumlental space and increasing the amount of albumin in the aqueous. Operations of iridectomy and removal of the lens are the usual recourse for this condition.

In the anterior types (1) the diagnosis is assisted by transillumination. The diaphanoscope is best applied to the sclera at the outer canthus after application of 2 per cent. alypin or 5 per cent. cocain, although the light may be passed through the lids for super-

ficial examination. The pupil is thereby lighted up and if the eye be looked at obliquely the ciliary body on the opposite side will appear as a dark ring—the circumlental space as a clear ring at the root of the iris between the rounded margin of the lens and the ciliary processes. This is usually from 5 to 6 mm. wide. If the lens diameter be increased or if it be further forward than normal, or if the ciliary processes be thickened by congestion, this space is encroached upon and may be obliterated. The circumlental space is enlarged during accommodation. In this observation I am particularly pleased to corroborate the findings of Professor Hess.

Anatomical conditions, as a narrow circumlental space, predispose toward increased ocular tension, and individuals of families who are prone to anterior glaucoma will most of them be found to have a narrow circumlental space. In this finding I have many times corroborated Tenney's observations.⁴ Such conditions, however, do not cause glaucoma, but in them a small degree of swelling or congestion of the root of the iris or the ciliary process tends to block up the space around the lens and thus interferes with drainage from the posterior to the anterior chamber and the filtration at the iridic angle. Traumatic cataract causes much the same conditions.

(2) In posterior glaucoma, unless the anterior chamber becomes smaller—and this is by no means always the case in the chronic simple non-inflammatory type—diaphanoscopy is negative.

In glaucoma produced by intraocular tumors the shadow of the tumor may be seen, and if the anterior chamber be affected the conditions above described will also be readily demonstrated.

The lighting up of the eye by diaphanoscopy gives us some idea of the mechanism of glaucoma and the anatomical conditions that predispose to this affection. We clearly see that the anterior chamber is smaller, that the lens is further forward, and that the iridic angle and circumlental space are encroached upon. Thus we see that diaphanoscopy of the eye in glaucoma is a valuable corroborative method of examination.

4. Tenney, J. A.: "The Relation of the Circumlental Space to the Causation of Glaucoma as Shown by the Würdemann Lamp" and Würdemann's Discussion. *Jour. A. M. A.* July 27, 1907.

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- * Würdemann, H. V.: "Diaphanoscopy of the Eye," *Ophthalmic Record*, November, 1906. "The Differential Diagnosis and Prognosis of Tumors of the Uveal Tract," *Journal A. M. A.*, June, 1906. "Diaphanoscopy of the Eye in Glaucoma," *Ophthalmic Record*, January, 1908. "Additional Observations on the Use of the Ocular Transilluminator," *Ophthalmic Record*, April, 1908.

THE DIAPHANOSCOPE FOR FOCAL AND OBLIQUE ILLUMINATION.

In the course of these examinations and in the experimental investigations which led to the design of my instrument in 1906, I found many uses in addition to transillumination. Oblique illumination of the anterior part of the eye by this "lamp" is much more satisfactory than the ordinary way of using a condensing lens to focus the light from a gas flame or electric burner. The pencil of light from the transilluminator is the only source of illumination, being a beam of even intensity with little of the diffrangent rays that we get from a condensing lens. Extraneous illumination does not interfere, for the light is placed solely on the spot to be examined. Thus the search for minute foreign bodies and abrasions on the cornea, spots of pigment and deposits on Descemet's membrane is facilitated. I have many times demonstrated and removed foreign bodies and seen abrasions invisible to other means of examination. Small maculæ—the scars of old minor injuries—stains from emery and iron are readily seen. Thus in the case of such men as iron workers who have frequently had minor injuries to the cornea, the lowered visual acuity resulting therefrom has been demonstrated to be due to small maculæ in the visual zone of the cornea.

In operating for the removal of foreign bodies, and particularly in operations for discission of cataract, and even for the cataract or iridectomy operation itself, the focal illumination afforded by the instrument is of much value, for the form, size and non-heating qualities of the instrument allow it being brought very close to the operative area. Thus discission of the capsule and post-operative membranes may be readily done. The finest membranes are easily seen and may be accurately discided. Other uses for focal and oblique illumination might be remarked and will suggest themselves.

I have made hundreds of these examinations and believe that transillumination of the eye is a necessary adjunct to the dark room examination.

REMARKS ON VIBRATORY MASSAGE IN EYE DISEASE.*

LEARTUS CONNOR, A.M., M.D.
DETROIT, MICH.

(Continued from p. 417, April, 1908.)

"Piesbergen (*Ophthalmological Review*, vol. xviii, p. 78, *Centralblatt für Augenheilkunde*, February, 1899) employed an instrument used by photographers to retouch negatives. The vibrations were produced as in the Edison pen, but were only 200 per minute. In a case of sclerosing opacity with scleritis, in a woman, aged 65, by six months' vibratory massage treatment, he raised vision from 6/lx to 6/xxv in one eye and from 6/xxxviii to 6/xxiv in the other, the opening clearing considerably. He continues the massage till injection ceases to appear after the treatment. He reports two cases of scleritis of several years' duration cured by vibratory massage.

"In three cases of syphilitic iridochorioiditis, after acute symptoms had vanished under treatment, vision was improved under every sitting. More striking was his success in chorioiditis and chorioretinitis, as there were a more sharply defined disc, a diminution of the scotomata, an increased color field and central vision.

"Of eight cases treated, four were old syphilitics. In a woman, aged 44, affected eight years, vision increased from 6/xxv to 6/xx in one eye and from 6/xxv to 6/xv in the other. She became able to read newspapers as she had not done in years.

"In two patients suffering for eighteen years, there was an improvement from 1/xl to 1/x.

"One patient with vitreous opacity did not improve. In two patients of chronic chorioiditis, coming on after an obstinate attack of furuncles, the improvement was striking. Two other cases were markedly improved. In five cases of high myopia, with central chorioidal alterations, vibratory massage gave improvement in vision, in two with apparent reduction of myopia of about 3 D. In a case of postneuritic atrophy, vision improved from 4/lx to 6/xxxv with enlarged visual field, but in a case of single atrophy no improvement followed."

* Through printer's error this last portion of Dr. Connor's article was omitted from the April issue.

CONCLUSIONS.

1. Vibratory massage places a new force at the ophthalmologist's disposal.

2. To the pressure and varied movements of finger massage the vibratory adds a great variety of vibrations, not only at point of contact with the eyeball, but simultaneously at all other parts and adjacent tissues of the orbit, and to an undetermined extent along the vessels and nerves. It can not be doubted that such vibrations arouse to more normal activity all cells concerned in either eye nutrition or the acts of seeing.

3. Vibratory massage, under certain conditions, reduces ocular tension, accelerates intraocular circulation, clears the media, deepens the red reflex of the fundus, improves vision and promotes ocular comfort.

5. Vibratory massage demands an instrument¹ adapted for use on the eye, its perfect control by the operator, a definite knowledge of existing pathological conditions, a full comprehension of the nature of the force employed, and common sense in technique.

6. The best method of using vibratory massage must be worked out separately in each case. If the symptoms be slight, massage may be more frequent and energetic. Some cases need daily treatment, others thrice, twice or once per week, from one minute to ten minutes each time. Subjectively patients are most improved by weak massage for a brief period; after long sittings they do not see so well, but later improve. No pain should accompany or follow the treatment.

7. Present experience encourages further work in this field.

1. The instrument for mechanical vibratory massage of the eyeball found most convenient and effective was made by the Whappler Electric Controler Co., 177 E. 87th St., New York. The same instrument is capable of giving oscillatory pneumo-massage if desired.

Abstracts from Recent Ophthalmic Literature.

AMBLYOPIA AND BLINDNESS.

ON AMBLYOPIA OF STRABOTIC EYES.—BECKER, F., Düsseldorf (*Deutsche Medizinische Wochenschrift*, 1908, No. 7, p. 280), thinks that strabotic eyes very frequently are originally defective, but that their amblyopia is aggravated by strabismus. It is very important to ascertain whether this deficiency is congenital (retinal hemorrhages during birth), and at what time strabismus developed. Becker explains the lacking influence of strabismus operations on the amblyopia by the gradual predominance of the centers of the fixating eye, which cannot be altered by operations on the muscles, but occasionally by other measures. Here the duration of strabismus is also of great importance. Under all circumstances early treatment of the amblyopic eye by careful correction of refractive errors, operation, with prolonged atropinization of the good eye, is advisable. C. Z.

ANATOMY.

AN ANATOMICAL EXAMINATION OF A CASE OF EVUSIO NERVI OPTICI (SALZMANN) IN AVULSIO BULBI.—REIS, Lemberg (*Graefe's Arch.*, lxxvii, H. II, Jan. 21, 1908), records a case where this condition was present in a man 37 years of age, as the result of a blow from a horse's hoof. There was a lacerated wound with comminution of the superior orbital margin and of the frontal bone. The eye, which was entirely separated from the surrounding tissues, was in front of the orbit and apparently attached by a strand of the internal rectus muscle; bringing the case in the class of avusio bulbi incompleta.

Microscopic examination showed that the optic nerve was empty in its entire extent. In the position of the nerve fibers there was a flattened irregular opening surrounded by the thickened hyperemic outer sheath of the nerve. In the ocular end of the nerve there were remnants of the vitreous and blood clot. In its further course it lost this and consisted only, in section, of an irregularly formed flattened opening surrounded by the thickened and hyperemic dural sheath. From this examination it follows that the case was one of tearing out of the optic nerve at the level of the lamina cribrosa—so-called evulsion nervi optici, and from it the following questions may be answered: 1. What

is the relation of the lamina cribrosa to the walls of the scleral canal? Is the lamina cribrosa torn away from the walls of the canal simultaneously with the tearing out of the optic nerve fibers? 2. What is the behavior of the outer sheath of the optic nerve in such injuries of the eyeball?

As to the first question, it is seen that everywhere on the periphery remnants of the lamina cribrosa are present that principally the central portion was torn out and where the opening measures 1.5 mm. still narrow strips of the lamina remained attached to the walls of the canal. As to the second question, the sheath of the optic nerve was uninjured throughout its entire length. The separation of the stem of the optic nerve took place between the outer and middle sheaths where normally the union is quite slight. In this case damage to the outer sheath occurred from the contact of the horse's hoof, and then as the result of the mechanical force of the avulsion of the globe the optic nerve itself was torn out at the level of the lamina cribrosa. W. Z.

CONTRIBUTION TO THE EMBRYOLOGY AND ANATOMY OF THE IRIS AND THE PIGMENT EPITHELIUM OF THE RETINA.—LAUBER, Vienna, (*Graef's Arch.*, lxxiii, H. 1, April, 1908). The following conclusions were based upon the study of the eyes of a number of human embryos, eyes of newborn babes and the eyes of infants ranging from 6 days to 14 months, together with several whose eyes were unknown; and the embryos of swine and cats:

The first trace of retinal pigment in mankind appears in the equatorial region of the outer layer of the secondary optic vesicle upon the inner side of this membrane. The smallest embryo measured 7 mm. Feline embryos of 5.3 mm. possess no pigment, those of 10 mm. are past the first stage of pigmentation. In 7 of 11 mm. the pigmentation was quite marked. The pigmentation of the retinal epithelium proceeds more rapidly anteriorly than posteriorly and in embryos of 11 mm. has reached, in places, the secondary vesicle. Similar conditions are present in cats and swine. The pigmentation of the posterior retinal layer of the iris reaches the ciliary body by the seventh month. In the iris stroma towards the ciliary body, the cells of the secondary vesicle are more highly and strongly pigmented. The iris cleft, which in the beginning is quite marked, grows gradually less but remains visible, here and there, until birth.

In the fourth lunar month the structure of the sphincter becomes apparent as solid cones of pigment which grow from the margin of the eye cup. The duplicature of the retinal layer of

the iris remains in all stages of development also behind the sphincter.

The portion of the outer layer of the secondary optic vesicle lying behind the sphincter, as well as the cylindrical cells lying ciliarywards, help to build up the sphincter.

The boundaries of the superior and inferior cells (lying behind the sphincter) of the anterior layer of the iris is the site of the development of the spurs of Michel. They appear in the fourth lunar month. Behind the sphincter and soon after its appearance, pigment spurs which penetrate it, develop.

The spurs of Michel and the spurs posterior to the sphincter free themselves of cells, which wander anteriorly and remain as pigment cells (clump cells). The cells of the rudimentary sphincter are strongly pigmented. The pigment gradually diminishes but is still visible at birth.

Before the fourth lunar month the iris stroma cannot be differentiated from connective tissue. In the fourth lunar month the stroma cells are differentiated in as much as processes appear. In the seventh lunar month the contrast between the anterior limiting membrane and the loose spongy stroma is plainly marked. In the eighth lunar month, along with the retrograde metamorphosis of the iris pupillary membrane crypts appear in the pupillary part of the iris. The pigmentation of the stroma cells is at the earliest first noticed in the ninth lunar month.

Munch's anatomical finding of the spiral structure of the protoplasm of the stroma cells, in man, is confirmed, as well as his assertion as to the innervation of the stroma cells. In the macacus rhesus the longitudinal striation of the stroma cells is plainly visible.

The development of the iris is not completed at birth, and reaches its completion only in the second or third year of life.

W. Z.

ANOMALIES.

BILATERAL CONGENITAL TEMPORAL HAIR ISLETS: ACCESSORY EYEBROWS.—DODD, H., Work, London (*Ophthalmoscope*, February, 1908). A girl of 19 years presented a congenital patch of hair on each temple, back of, but entirely separated from the eyebrow. The hair was of the same quality and color as the eyebrow. The condition is supposed to be due to cutting off of eyebrow tissue in the process of embryonic growth. It is supposed to be very rare.

M. B.

ANKYLOBLEPHARON FILIFORME ADNATUM.—REIS, W. (From the clinic of Prof. Machek in the University of Lemberg. *Archiv fuer Augenheilkunde*, 58, p. 283.) The upper and lower lid borders of the left eye of a newborn child were, at the center, adherent by a thin white thread. When loose, it was 2 mm. long, but when the upper lid was raised it was stretched out to 5 mm. The insertions spread like cones.

Literature contains only 5 cases of this rare affection, which are explained either as congenital anomalies of development or remnants of inflammatory processes during fetal life. The thread was cut off. It consisted of a peripheral portion, composed of epithelia, and a central portion of connective tissue with capillaries filled with blood corpuscles. Hence the author infers an inflammatory process as the most probable cause of the affection. C. Z.

THREE CASES OF MICROPHTHALMIA.—COSMITTATOS. (*Annales d'Oculistique*, February, 1908.) Van Duyse divides microphthalmic eyes into three classes, 1st, Microphthalmia or nanophthalmia, the eye has normal form and structure but its size remains below the normal; 2nd, Microphthalmia with coloboma of the iris; 3rd, Microphthalmia with extensive malformations and considerable reduction in volume. According to the extent of the lesions of the membranes there may be a little vision or none.

In one of the cases reported by the author there was coloboma of the iris and opacity of the lens. In the second case the eye was represented by a little fibrous mass in which it was not possible to recognize microscopically the tissues of the eye. In these two cases there was no vision and there was no malformation in other parts of the body. In the third case the microphthalmia was accompanied by malformations of the membranes of the eye, and of other parts of the body—"Wolfe jaw"—and double vagina.

Microphthalmia may be due to arrest of development or to intra-uterine inflammation of the membranes of the eye. In some cases there is no sign of inflammation of the membranes, and these cases are usually accompanied by other malformations which indicate a general arrest of development. In other cases there has been inflammation causing fibrous bands which prevent the ocular membranes from developing.

In the author's second case there existed an amniotic bridle adherent to the anterior surface of the globe and obstructing its development. This was attributed to a blow from a cow's horn that the mother had received before the birth of the child and before its eyelids were closed. In the third case the inflammation

of the cornea and the presence of fibrous bands in the ocular cavity showed an intrauterine inflammation of the embryonic mesodermic tissue, probably the result of some general pathologic cause which at the same time provoked other malformations.

G. C. H.

CONCERNING MICROPHTHALMOS AND CONGENITAL ANOPHTHALMOS WITH SEROUS ORBITOPALPEBRAL CYSTS.—NATANSON, Moscow (*Gräfe's Arch.*, lxvii, H. 2, Jan. 21, 1908) records two cases of microphthalmos with cysts. The first instance was seen in a female child of 14 months. The anomaly was bilateral. The cysts had produced a depression in the floor of the orbit, and their walls were attached thereto. There was also, on both sides, a second microscopic cyst. The inner wall of the cyst contained glial tissue, cylindrical epithelium and perverse retina. The second case was in a male child aged 10 years, with chronic internal hydrocephalus. There were bilateral double cysts. The inner wall of the cyst contained glial tissue and cylindrical epithelium. From a study of his own cases and those in literature the author concludes:

1. Congenital serous palpebral cysts (orbitopalpebral cysts) are always associated with an imperfect development of the eyeball and have but a slight anatomic connection therewith.

2. These cysts represent in their anatomical construction, in the manner of their connection with the eyeball and in the mechanism of their origin, an entirely different anomaly from ectasic colobomata.

3. The terms "colobomeyste," "colobome enkyste" and "kyste colobomateux," introduced by Ewetzky and v. Duyse to describe these conditions, are incorrect, and should be abolished.

4. As a rule the cysts are observed in the lower lid. When the cysts are of large dimensions they may entirely fill the orbital cavity; when they are of small dimensions they may not disturb the position of the lid and may not be recognized clinically. In rare instances cysts of the upper lid have been observed.

5. These cysts occur in equal proportions between the two sexes. They occur twice as frequently monolaterally as bilaterally and as frequently on the right as on the left side. In one-half of the monolateral cases there are anomalies of development in the other eye. At times there are disturbances of development in other parts of the body. In a few cases there were evidences of an inheritance of one or the other of the ocular anomalies.

6. At times there are in connection with the *microphthalmos* not one, but two cysts, but this cannot be determined clinically.

7. The external coat of the cyst wall always consists of connective tissue, the inner coat of inverted retina, *i. e.*, with the layer of rods and cones towards the inner cavity of the cyst. The ganglion cell and nerve fiber layer are for the most part wanting. In the majority of the cases the differentiation of the retina has been arrested at a certain step and in consequence of the pressure of the fluids of the cyst and at times on account of secondary inflammatory processes exhibits pathological changes, in consequence a fully completed retinal structure exists only in places or is entirely absent, and in this case the inner coat is represented only by glial tissue in which lie the elements of the granular layers of the retina; some parts of the inner layer consist entirely of cylindrical epithelium, the analogue of the epithelium of the *pars ciliaris retinae*.

8. Anatomically, there are two groups of *microphthalmos* with cysts, which in reference to the mechanism and to the time of their origin are sharply separated.

Group I. The cysts are always associated with *microphthalmos*, which, usually, is clinically demonstrable. The reduced eye is usually quite satisfactorily formed. Upon its inferior wall immediately in front of the entrance of the optic nerve, there is a cleft through which the retina of the eyeball extends into the cyst of which it forms the inner layer. This cleft is entirely filled by the folds of the retina. A communication between the cavity of the cyst and the vitreous space of the eyeball is never present, but the cyst cavity communicates with the vitreous space between the retina and the pigment membrane of the eye, *i. e.*, with the previous cavity of the primary optic vesicle. This communication is only distinctly seen in those preparations where the retina at the position of the neck of the cyst has been accidentally separated from the pigment membrane upon which it had rested and the pigment epithelium gradually passes over into the inner coat of the cyst. (Cases of Ginsberg, v. Duyse, Hess.)

Group II. Clinically the diagnosis is always *Anophthalmus* (*c. cyst. palpebr. infer.*). The anatomical examination shows that nearly always the eye has not been fully developed: in the majority of cases but one cyst existed, which had developed on a posterior segment of the eye. At times there is also a poorly differentiated small ball present, which is connected with the posterior segment of the cyst. The interior of this small eyeball contains neither retina, vitreous nor lens. The interior of the eye-

ball communicates directly with the cavity of the cyst, in consequence of which the pigment membrane of the rudimentary eyeball immediately becomes the inner coat of the cyst.

9. The cases in Group I develop during the stage of the secondary optic vesicle. Their origin is associated with the delayed closure of the fetal eye-cleft and proceeds in the following manner: The closure of the cleft is hindered by a mesodermal strand which has grown into it and forms the fundament of the vitreous and undergoes either no, or a much delayed, metamorphosis. The retina seeks to overcome this obstruction and forms on a margin of the optic vesicle a duplication which, as the result of the active growth of the retina, penetrates into the surrounding mesodermal tissue. Through further growth of the retina and the accumulation of fluids between the two leaves of the duplication the cyst is formed. Consequently the inner layer of the cyst is composed of perverse retina which at the margin becomes transformed into the pigment layer of the eyeball. The cases in the second group originate in the stage of the primary vesicle, according to the theory of Mitvalsky. The uninvaginated leaf of the primary vesicle grows and becomes stretched as the result of the accumulated fluids and becomes converted into a cyst.

10. When the duplication of the retina takes place at both margins of the primary vesicle two cysts develop.

11. The origin of cysts of the upper lid cannot be definitely determined because of the insufficiency of well studied cases.

12. Inflammatory processes play no rôle in the origin of the cysts.

13. Ginsberg's theory of the origin of the cysts seems unlikely.

14. Accumulations of the fluids of the ventricles (v. Duyse), pathologic constriction of the amnion and pressure of the amniotic fluid (v. Duyse, Pichler), as well as abnormal circumference of the lens (Bach) cannot be recognized as causes of cyst formation.

W. Z.

BACTERIOLOGY.

SIX CASES OF PHLYCTENULAR CONJUNCTIVITIS ASSOCIATED WITH DIPLO-BACILLARY CONJUNCTIVITIS.—McKEE, HANFORD, Montreal (*Ophthalmic Record*, March, 1908). The author has observed six cases of phlyctenular conjunctivitis associated with the presence of large quantities of diplo-bacilli. They all got well promptly under the use of zinc. He does not claim that the phlyctenules were caused by diplo-bacillary infection, but where these bacteria are found the cases respond favorably to zinc.

M. B.

BACTERICIDAL SUBSTANCES IN THE CONJUNCTIVA.—NIDDER (Wiener Medizinische Wochenschrift, March 14, 1908). The tears of the normal conjunctiva do not possess bactericidal properties, but the pathologic secretion does possess such properties. This faculty depends upon the intensity of the secretion, and is always smaller than that of the blood serum of the same individual. The healing process of the conjunctival catarrh is based upon this bactericidal property. The therapeutic effect of astringents is based on the fact that they produce an increased transudation of the bactericidal inflammatory products, and by this they incite the tissues towards the destruction of the bacteria. The direct bactericidal property of the astringents is insignificant, for it destroys only the bacteria which are found in the secretions, and in the superficial epithelium, but not those which are confined to the deeper tissues.

J. G.

THE CULTURAL FEATURES OF A NEW PATHOGENIC MICRO-ORGANISM OF THE CONJUNCTIVA.—McKEE, HANFORD (Montreal Medical Journal, March, 1908). Different forms of conjunctivitis have been shown to be due to specific micro-organisms. To-day we have several well known types. The micro-organism here reported was obtained in pure culture in May last from a case of conjunctivitis which seemed different from the known types. With pure culture, two normal conjunctival sacs were inoculated, a conjunctivitis set up and the bacillus was obtained in pure culture, showing that this bacillus was the pathogenic factor in these cases, which number to date sixteen.

This organism resembles two of the known conjunctival bacilli closely, namely, the Koch-Weeks bacillus, and the bacillus of influenza. Clinically, the conjunctivitis was of the catarrhal form, with marked lacrimation. It was a palpebral conjunctivitis, the bulbar conjunctiva being quite uninvolved. There were no signs of influenza present in any of the cases.

The clinical picture differed widely from either the conjunctivitis set up by the Koch-Weeks bacillus or the bacillus influenzae. Upon smear the bacillus is seen to be exceedingly small, short and thick, and hardly distinguishable from a coccus. It stains easily with the aniline dyes, is decolorized by Gram's stain, and shows no polar staining. The surface of the agar has a blurred appearance, like a dull mist over it. This fine mist-like appearance on hemoglobin agar is the most constant and characteristic of its cultural features. The media must be of certain reaction and two or three days old. A peculiarity that has been constant

is the inability to cultivate it upon freshly prepared hemoglobin agar. Upon identically the same media this organism would remain pure, while the bacillus influenza would become contaminated.

Collecting some of the growth at the top of the tube by means of a platinum loop will show a colorless mass; the bacillus influenza growth in a similar manner shows a distinct white mass-like and white coccus.

In all of the cultural features which I have described this organism is widely different from the Koch-Weeks bacillus. In the majority of the features which I have mentioned it is vastly different from the bacillus influenza. The cultural features on hemoglobin agar alone are enough to satisfy the bacteriologist that this is a new conjunctival micro-organism. A comparison of the reactions of this organism in sugar-free bouillon, and a study of its cultural peculiarities, leave no room for the most skeptical.

F. A. and P. G.

CATARACT.

CONTRIBUTION TO THE OCCURRENCE OF CONGENITAL CATARACT IN THE SAME FAMILY.—ENSLIN, DR. (From the clinic of Prof. W. Uthhoff, Breslau. *Deutsche Medizinische Wochenschrift*, 1907, No. 48, p. 1998.) Cataract was inherited from the father by all his children, three sons and one daughter. The oldest son had fourteen children, of whom five, three boys and two girls, had cataract. His oldest son, afflicted with cataract, had one child: a girl, who also had inherited the disease.

The second son of the sire had six children, of whom three girls had cataract. The clinical histories of four of the members of this family are reported in detail. Some of them, who had been in asylums for the blind, were cured by discissions.

E. emphasizes, however, that, in general, primary extraction is performed in uncomplicated cases of juvenile cataract. C. Z.

SOME ACCIDENTS FOLLOWING CATARACT EXTRACTION.—PUC-
CIONI, G., Pavia (*La Clinica Oculistica*, February, 1908). The writer reports a case of severe hemorrhage following cataract extraction. The patient, 65 years old, had a mature, senile cataract in the O. S. There were no local contra-indications to an operation. The urine contained a small quantity of albumin and some hyaline casts. After placing the patient on a milk diet to diminish the albumen, the cataract was removed. The excision of the iris gave place to a slight hemorrhage which did not disturb the operation. On the third day the dressing was saturated with

blood, the corneal wound was cicatrizing and the anterior chamber was filled with limpid blood. A bandage, slightly compressive, was applied. During the night, without apparent cause, the patient complained of sharp pain in the eye and on the following morning the bandage was found saturated with blood and the corneal wound partially open. Through the small opening blood mixed with aqueous was issuing. The bandage was reapplied and subcutaneous injections of ergotin given. The next day, the fifth, the hemorrhage seemed under control. On the sixth day, it reappeared worse than before and continued the seventh, eighth and ninth days. Three injections of ergotin were given daily. On the tenth day ice was applied, chlorid of calcium given internally and clysters of gelatin used. On the eleventh day the hemorrhage ceased, the corneal wound was cicatrizing, the anterior chamber was filled with blood. On the twelfth day the upper part of the pupillary field was clear and the patient could distinguish fingers. The blood was rapidly absorbed and on the sixteenth day no trace of it could be seen. V. was 5/xx.

R. H. J.

A CASE OF DISLOCATION OF THE NUCLEUS OF A HYPERMATURE CATARACT DURING OPERATION.—BLUMENTHAL, L., Riga (*Beitrag zur Augenheilkunde*, lxx, 1908, p. 593). The small yellowish, almost white, nucleus disappeared, upon pressure on the lower portion of the cornea, through the coloboma of the iris, backwards and B. considered extraction by spoon too dangerous. There was no irritation for five days, when increased tension, chemosis and slight swelling of iris with one posterior synechia developed, which were treated with antiphlogistics. Six weeks after the operation the nucleus, of 3 to 4 mm. diameter, was easily extracted with Pagenstecher's spoon, with moderate loss of liquefied vitreous. V=1/5 with +10.00.

Blumenthal believes that in hypermature cataracts with atrophy of the zonula the extraction of the nucleus, immediately after cystotomy without attempts of expression, with the spoon is preferable to the method of Pagenstecher, of extracting the lens within its capsule.

C. Z.

ON RECLINATION.—KRAUSS, W., Marburg. (From the eye clinic in the University of Marburg. *Zeitschrift für Augenheilkunde* xix, January, 1908, p. 32.) Two and a half weeks after a preparatory iridectomy the extraction of a cataract brunescens was attempted in a man, aged 53, affected with myopia. As immedi-

ately after the section liquefied vitreous oozed profusely, the operation was discontinued. About four months later the lens was turned downward and backward into the vitreous through a sub-conjunctival puncture from the upper sclero-corneal junction. The resulting V. was 4/lx. The lens fluctuated up and down on movements of the eye.

On the left eye the extraction with Weber's loop was successful. The patient could see well with his right eye for two years; then the eye became inflamed and grew blind from iridocyclitis. This was attributed to the constant tractions at the zonula by the not sufficiently reclined lens. Krauss thinks it might have been avoided if the lens had been completely sunk into the vitreous, as experience shows that spontaneously dislocated lenses may, for years, be tolerated by the vitreous without reaction. He concludes, however, that in a similar case he would attempt rapid extraction of the lens in spite of profuse loss of vitreous. C. Z.

ON OPERATIONS FOR SECONDARY CATARACT.—WEILL, G., Strassburg i. E. (*Zeitschrift fuer Augenheilkunde*, 1908, xix, p. 126), enumerates the possible complications of operations for secondary cataract as infection, loss of vitreous, secondary glaucoma, incarceration of the membrane of the secondary cataract, traction on the ciliary body and iris and hemorrhages, dangers of general narcosis, and asserts that they may be avoided or greatly reduced by his method with the two harpoon needles of Stilling. Weill performed it 130 times within the last few years and saw Stilling perform it 30 times. Infection, or loss of vitreous, never occurred, once secondary glaucoma and once an irrelevant hemorrhage from the iris. The method is described in detail and Weill says that the weak point of it, viz., that the hook of the needle may become entangled in the cornea in pulling it out, can easily be overcome by practice on the test drum. C. Z.

CASUISTICS.

A REVIEW OF THE OCULIST'S RECORDS FOR TEN YEARS AT THE OHIO STATE SCHOOL FOR THE BLIND.—BROWN, JOHN E., Columbus (*Ohio State Medical Journal*, April 15, 1908). At this institution ophthalmia neonatorum is the most prolific cause of blindness found, the average for ten years being 17.6 per cent. The writer suggests that a printed slip be left at the bedside of every parturient not under the daily notice of the physician, calling attention to the destructive nature of inflammation of the eyes of the newborn. He gives a form for a leaflet which might be given

to mothers and nurses. Sympathetic ophthalmitis is also an important factor in causing blindness. Pemphigus conjunctivæ with desiccation of the cornea from drying resulted in only light perception in two cases. Daily inunctions of castor oil, which smoothed the corneal epithelium and increased its transparency, gave fair form vision.

Some consideration is given to ectopic lentis, albinism and aniridia, and several other anomalous and pathological conditions. Out of eighty cases of congenital blindness, fifty-one were congenital cataract. Many of these cases were operated upon, three operations being required generally, needling, extraction, and a final operation on the capsule. Rather better results have been obtained from a free discission producing rapid swelling and breaking up of the lens, necessitating linear extraction a few days later. One reason for this is that a pyramidal calcareous mass sometimes 2 mm. in its longest measurement is usually found in the lens nucleus or directly under the anterior capsule, which, if not removed, is held responsible for the very thick, tough membrane resulting. There is a wide variation in the acuteness of vision in congenital cataract, the best recorded being 20/xxx, and from this down to the poorest form vision. Two satisfactory cases of operation in high myopia are recorded, also operative procedures in a number of cases of complicated cataract, two cases of double iridocyclitis, and a case with double degenerative (brown) cataract with subnormal tension and tremulous iris, which after two operations with an inflammatory attack between, obtained with correcting lenses 20/xxx vision.

CIRCULATION.

TO THE QUESTION OF EMBOLISM OF THE CENTRAL RETINAL ARTERY.—FRUCHTE, W., Barmen (from the eye clinic of Prof. Oeller in the University of Erlangen, *Klinische Monatsblätter fuer Augenheilkunde*, xlv, i, 1908, p. 245), describes clinically and anatomically a case of embolism of the central retinal artery with instantaneous blindness in a man, aged 53, who died three weeks later. The autopsy revealed severe chronic and recent ulcerous endocarditis, stenosis and insufficiency of the aortic and mitral ostia, moderate arteriosclerosis, general sepsis with numerous infarctions in all organs and embolisms of the skin. He presented all three requirements, claimed for embolism of the central retinal artery by Harms in his elaborate article (reviewed in OPTHALMOLOGY), viz.: (1) closure through a formation brought into the previously freely permeable lumen and exclusion of a primary

affection of the wall; (2) a source of the embolus in form of a valvular disease of the heart or another disorder of the body leading to the formation of thrombi; (3) lack of symptoms of a thrombotic obstruction. The embolus, immediately behind the lamina cribrosa, consisted of a homogeneous formation, covered with a single stratum of cells, and touched a small place of the lower medial wall of the central artery. It was not fibrinous, rather of hyaline character with tendency to calcification in the center and undoubtedly originated in the diseased valves of the heart.

For the characteristic red spot of the macula Fruchte retains the old explanation that the opaque retina at the thinner macular region allows the chorioid to shine through and that the contrast of the greenish gray surroundings increases the effect. C. Z.

A CASE OF EMBOLISM OF THE CENTRAL ARTERY AND RETINITIS HEMORRHAGICA. — ERLANGER, MOSES (Doctorate thesis), examined microscopically both bulbi with their optic nerves, a part of the right arteria fossæ Sylvii, and a brain tumor, under supervision of Dr. Sidler-Huguenin. The 62-year-old woman came on May 10, in the Zürich clinic. Three days previous she noticed with the left eye an obscuration. On the following morning she saw better, but in the afternoon worse again. In the left eye only perception of light; right eye 4/xv. Ophthalmoscopically two small retinal hemorrhages on the inferior temporal artery and vein are found and some small light patches between disc and macular region. In the left eye the picture of so-called embolism of the central artery: milky white opacity of the posterior pole of the retina with cherry-red patch in the macula. A small part of the retina is not changed, which is nourished by a cilio-retinal vessel. Four small hemorrhages, streaklike, are seen at the under border of the opacity; the optic nerve is very pale; in the vascular funnel a gray round spot, which looks as an embolism; the very thin arteries are recognized as fine blood stripes only in the direct image; the blood column is everywhere present, except in the superior temporal artery, which is changed in a fine white strand and in it the blood current is interrupted. The veins are hardly distinguishable from the arteries. Strong systolic and presystolic murmur, especially over the tricuspid. No sugar nor albumin in the urine.

Patient showed ten months later a right facial palsy. Some months previous left arm and leg became paralyzed; motion of the arm can now be considered normal. Pulse 74, hard, tense. In the right fundus some fresh hemorrhages at the temporal side of the

disc and one at a distance of 1.5 disc-diameters at the nasal side of the optic nerve; in the periphery senile pigmentation. In the left eye total optic atrophy, arteries very thin, veins somewhat broader. Two months later the general condition had become worse; she is imbecile and blind. Patient died 15 months after first examination. Much fluid was found in the subarachnoidal cavity and the ventricles, especially the third ventricle contained opaque fluid. The cerebral vessels are arteriosclerotic. In the floor of the right ventricle, next to the thalamus opticus a grayish-white soft mass of pea-size and a focus of softening in the inner capsule from knee backward, 2 c. m. long. The cerebellum shows at the left side an impression from a tumor originating at the inner margin of the sigmoid sinus. Two small hyalin nodules are found on the physiologic closing-margin of the mitralis. The intima of the aorta shows some arteriosclerotic changes, also the coronary arteries.

Serial coupes through both optic nerves and eyes nowhere showed an embolism. The pathologic changes, with the exception of a few degenerative changes in the retina, are found as sclerotic changes of the vessels. Chiefly the arteries, less the veins. They are everywhere endothelial proliferations with regressive character, which narrow the lumen, in some places to a twentieth. The still present vessel lumen is lined with a well developed elastica intima, on which the endothelial nuclei rest. These appear often normal, often they are proliferated, nowhere in more layers. The newly formed tissue between the old and new elastica intima consists of fine fibrillary substance, in which, chiefly in the more central layers, many newly formed elastic fibers and thin long cells next to thick round cells, lie. Toward the periphery, that is, toward the original elastic intima, large spaces and cavities appear, which are empty or filled with granular detritus; they are therefore caused by degenerative changes. In the central layers chronic inflammatory (arteriosclerosis), and in the peripheral regressive processes (atheromatosis) exist. Externally the vessel closes mostly with some elastic membranes. The intensive vessel changes explain that disturbances in the blood pressure as f. i. in this case, where a disease of the heart was present, could produce extensive disturbances of the circulation in the peripheral vessels, even total suppression of the blood current. Such interruptions can produce the same symptoms as an embolism. Circulatory disturbances appear especially in such vessels, which show restrictions and dilatations of the lumen in short distances, as here the left central retinal artery and the art. foss. Sylvii show. The

smaller arteries of the optic nerve and the retina show also a decided arteriosclerosis. Some smaller vessels are entirely obliterated through the thickening of the wall.

The veins also show sclerotic thickening of the walls; only here chronic inflammatory processes are found, nowhere decay of the newly formed tissue. In the central veins of the optic nerve, especially in the lamina cribrosa, blood stasis appeared: a homogeneous, serous coagulation-layer, with some mono- and multi-nuclear leucocytes are seen over the endothelium; the center of the lumen is filled with red blood corpuscles. It did not come to a real thrombosis, as no fibrinous net could be demonstrated in the peripheral homogeneous border layer. Here also the observation of different writers was proved, that especially the place where the central vessels bend in the axial connective tissue stand and the region of the lamina cribrosa are predisposed for endarteritic changes with symptoms of stasis.

The right central retinal artery was less diseased; the endarteritis, which had nearly closed the lumen, was only found in the lamina cribrosa. In the other vessels, in which this disease has progressed, the endarteritic changes were found more or less over the whole course.

In the art. foss. Sylvii are found with sclerotic thickening of the endothelium some small thrombotic masses.

The tumor was an endothelium of the dura, in which bright red colored large hyalin "Schollen," with van Gieson, were remarkable.

E. E. B.

CONJUNCTIVA.

A CASE OF VERNAL CONJUNCTIVITIS SHOWING UNUSUAL CORNEAL CONDITIONS.—POSEY, WM. CAMPBELL, Philadelphia (*Ann. Ophthalm.*, Oct., 1907). A young colored woman had suffered from vernal conjunctivitis since childhood. Her cornea gradually became involved until vision was reduced to 1/lx in the right and 2/lx in the left eye. The corneæ were surrounded by a slightly elevated zone of yellowish white tissue and their transparency destroyed throughout by irregular opacities, which seemed to be made up of a hyaline degeneration of reduplicated epithelial and sub-epithelial elements. The center of each cornea appeared to be avascular but numerous small vessels extended over the limbus from the surrounding conjunctiva. The treatment used was massage of the cornea with ointments of increasing strengths of yellow oxid of mercury and dionin. Pilocarpin, 1/2 gr. to the ounce, was used twice daily. The eyes were also steamed several

times daily with hot vapor. Under this treatment the ocular condition gradually improved, the corneæ became less injected and the eyes quiet, with vision of 5/1x. M. B.

A NEW FINDING IN SPRING CATARRH.—REIS, Bodo (*Deutsch-Medizinische Wochenschrift*, 1908, No. 7, p. 312), observed peculiar changes of the intima, chiefly of the precapillary blood-vessels of the subtarsal net; marked hyperplastic thickening of the intima and separation of the endothelia of the intima from the internal elastic sheet by vacuoles, swelling and sometimes excessive rarefaction of the separated cells, which may lead to a more or less complete closure of the lumen. These changes greatly resemble the "vacuolizing degeneration of the intima," due, according to Birch-Hirschfeld, to the influences of radiation (by Roentgen rays, radium, high frequency currents) on the endothelium of the intima. This would be very much in favor of the assumption of the influence of ultraviolet rays in the etiology of spring catarrh.

C. Z.

A NEW CASE OF PARINAUD'S CONJUNCTIVITIS.—SCHÖLLER, F., (from the eye clinic of Prof. H. Schoeler, Berlin, *Deutsche Medizinische Wochenschrift*, 1908, No. 8, p. 331). So far 48 cases of Parinaud's conjunctivitis have been published. Schoeler observed it in the left eye of a girl eighteen months old, with swelling of the parotid and the glands behind the ear and of the neck, without suppuration. The conjunctival changes consisted in granulations, yellowish nodules, erosions of the epithelium and indurations of the lids, chiefly the lower one. The moderate secretion was serous, with shreds, cornea intact. There was general malaise with rise of temperature. The possibility of infection through animals could not be excluded, but was scarcely probable. C. Z.

PROPHYLAXIS AND TREATMENT OF SUPPURATION OF THE CONJUNCTIVA IN THE NEWLY BORN.—GREEF, R., DR. (*Wiener Medizinische Wochenschrift*, February 28, 1908.) The writer favors a weaker solution of silver nitrate than is usually employed in Credé's method; he considers a $\frac{1}{4}$ per cent solution sufficient. He advises against the use of strong silver nitrate solutions as a routine procedure, and prefers frequent washing with 0.1 per cent silver nitrate solution. J. W.

THE TREATMENT OF PURULENT OPHTHALMIA.—HARRIS, H. B., Dayton (*Ohio State Medical Journal*, March 15, 1908), uses 0.2 per cent. solution instilled freely every one to four hours

very effectual. When the cornea is hazy, he instills one drop of a $\frac{1}{2}$ per cent. solution of pilocarpin once a day. Atropin is used if the cornea becomes involved. After quoting statistical reports of cases the writer concludes that: "(1) The application of the modern salts of silver is far easier, requiring very little manipulation of the eye, is safer, and produces better results than the application of nitrate of silver. (2) Either argyrol or protargol is an eminently efficient remedy in ophthalmia neonatorum and gonorrheal ophthalmia in general, with the preference given to argyrol. (3) That the use of cold in these cases is dangerous and should be abandoned."

M. D. S.

BLENNORRHEA OF THE EYE. FROM A MEDICO-SOCIAL VIEW-POINT.—STOTTER, J., Cleveland (*Cleveland Med. Jour.*, April, 1908), notes that there are mild cases due to gonococcus infection, as well as severe ones due to other, generally less virulent, micro-organisms. The treatment with nitrate of silver, specific since 40 years, has not been displaced by any effectual substitute, although one of the latest, a 10 per cent. ointment of alum acetate with vaselin, is deserving of trial in adults, where, as is well known, the prognosis is so unfavorable. Ignorant and negligent midwives are responsible for most of the cases in children. The importance of the social side of the subject is found in the large number of the children deprived in after life of the ordinary means of self-support, and the added burden on the community at large. Blennorrhoea being in the highest degree "communicable," failure to notify the board of health is criminal and should be punished.

P. H. F.

PREVENTION AND TREATMENT OF OPHTHALMIA NEONATORUM.—PARKER, H. C., Indianapolis (*Indiana Med. Jour.*, Jan., 1908), reminds us that gonorrheal conjunctivitis of the newly born is one of the commoner diseases of the eye and at the same time one of the most dangerous, as it causes nearly 50 per cent of the blindness in the world. It can be absolutely prevented by the proper use of Credé's method of prophylaxis, instillation of silver nitrate 1 per cent. or 2 per cent. solution, immediately after birth, and, should the disease develop either through faulty technique, or negligence, it can be cured without permanent harm to the sight if treated at the beginning with frequent boric acid irrigation, instillation of 25 per cent. argyrol every two or three hours, and careful removal of secretion, while the sound eye is protected by an occlusive dressing after about half a dram of iodoform powder has been placed in the inner corner.

P. H. F.

A CASE OF OPHTHALMIA NEONATORUM FOLLOWED BY PYEMIA AND DEATH.—LEWIS, FRANK A., New York. (*Ophthalmic Record*, January, 1908.) Parents both had gonorrhea. Child developed ophthalmia neonatorum on the third day after birth and was admitted to the Manhattan on the 18th day after birth. The treatment used was boric acid wash, iced applications, 25 per cent. argyrol every hour and 2 per cent. silver nitrate once daily with atropin three times daily. In ten days after admission the eyes were quite normal in appearance. Five days previous to this an abscess was opened over the external malleolus of the right foot, the pus containing gonococci. Abscesses continued to form in the various extremities as well as on the trunk until in all seven abscesses were opened, each containing from two to three drachms of pus. Three weeks after admission to the hospital the child died, apparently from pyemia.

M. B.

CONJUNCTIVITIS FROM THE VENOM OF SERPENT.—BARGY. (*La Clinique Ophthalmologique*, October 10, 1907). The author quotes from the "Precis de maladies exotiques" of Le Dantec (2nd edition, 1905, p. 1122). There is found in tropical Africa a serpent whose salivary secretion is so abundant that the venom flows from the mouth at the least excitation, its name being the "spitting serpent." Maclaud, in 1896, had the opportunity of observing the spitting ophidian and verifies the salivary condition. This saliva coming in contact with the eye can produce a kerato-conjunctivitis. Bargy states he also has had the opportunity of confirming this in a case which he relates. A sergeant was awakened at 2 a. m. July 20 last by a noise in his chicken house (the sergeant had previously killed two large spitting serpents (*spedo hemochates*) measuring 2.10 m. in length), and on going into the chicken house he saw a serpent of the same species, and killed it with his gun. Believing the reptile dead, he approached it with a light, when the snake suddenly projected into the man's left eye some of the saliva from about a meter's distance. At the moment the man felt a scalding sensation and began washing the eye with water, and seven hours later consulted Bargy. The bulbar conjunctiva was intensely congested, but the cornea was normal; there was photophobia and an abundant secretion, but no pus. A boric acid wash was ordered, with a weak zinc sulphate solution. The following day the eye was about the same, cornea intact. In three days the symptoms were ameliorated. In five days the eye was normal.

B. E. F.

INDURATED CHANCRE OF THE CONJUNCTIVA.—AUBINEAU. (*Annales d'Oculistique*, July 1907). The wife of a sailor, twenty-two years of age, had noticed a slight secretion in the right eye, with a sensation of discomfort, for three weeks. On the conjunctiva of the lower lid there was a yellowish-white exudate, ten or eleven mm. long and three or four wide, which had the appearance of a very adherent false membrane. The preauricular gland was swollen to the size of an almond, hard and indolent. A week later the exudate had invaded the cul-de-sac and extensive chemosis soon appeared. The lower lid commenced to swell and the submaxillary glands became involved. The eyelid was edematous and induration prevented eversion of the lid. The exudate lost its pseudomembranous character and was replaced by a shallow ulcer with irregular outlines, whose whitish color contrasted with the red of the surrounding conjunctiva. At the end of three weeks spirochetes were found in scrapings from the ulcer and a week later there was well marked syphilitic roseola, and treatment with bichlorid was commenced. In five or six weeks the cornea became cloudy, with the appearance of parenchymatous keratitis. At the end of two months the search for spirochetes was negative.

The final result at the end of ten months was as follows: The skin of the lid was flabby, the lashes had disappeared, the palpebral conjunctiva was cicatricial and dermatised. There was an extensive symblepharon, the cornea was cloudy and V. was reduced to counting of fingers (a result that it seems likely that an earlier and more vigorous mercurial treatment by inunction or injection might have considerably modified). G. C. H.

PURULENT CONJUNCTIVITIS IN AN INFANT DELIVERED BY CAESAREAN SECTION.—TERSON. (*Annales d'Oculistique*, July, 1907.) There is a general impression that ophthalmia neonatorum is always due to vaginal infection, and that this is nearly always gonococcic. Druais, on the contrary, as the result of an extensive study of the subject, asserts that not more than half of the conjunctivitis of the new born are of gonococcic origin, and the author says that his own experience confirms this view. Since various microbes may cause the disease, blennorrhoea should not be always charged against the parents. Cases of purulent ophthalmia in the new born occur in spite of the most thorough vaginal disinfection by the most careful accoucheurs. The disease can only be reduced to a minimum by the most rigid prophylaxis. The conjunctivitis, too, may occur before the infant is born. Children have been born with the cornea perforated or even with the

ball emptied by corneal sloughing from intrauterine conjunctivitis.

The case reported is that of a child delivered by Cæsarean section. As soon as its head appeared in the uterine incision those present noticed that its eyes were red, swollen and full of secretion. The author took charge of it as soon as possible and found it to be a case of very intense bilateral purulent conjunctivitis. Microscopical examination of the pus showed diplococci and staphylococci.

G. C. H.

CORNEA.

CORNEAL INFECTIONS.—BLISS, T. F., Springfield (*Ohio State Medical Journal*, March 15, 1908), believes the age and physical condition of a patient determines largely the susceptibility of the cornea to bacterial infection; secondary nutritive changes, often due to arteriosclerosis in persons old beyond their years, accounts for many infections following surgical operations. The writer uses protargol, and later nitrate of silver, for the most serious corneal infections. For external application he depends largely on muriate of ammonia in solution, hot or cold, dilute camphor, and steam. He uses camphor diluted almost to precipitation on a pad of cloth fastened to a pasteboard shield; this need not touch the lid, and the eye can be opened under the shield. He says the vapor is cooling and very agreeable to the eye, and relieves pain. Steam is used at a temperature that can be borne directly on the eye from five to ten minutes at a time, and gives great relief from pain. When the general physical condition is low he has found quinin in fairly large doses very valuable.

M. D. S.

CORNEAL ULCERS.—FRANTZ, C. P., Burlington (*Univ. Med. Jour.*, Dec. 15, 1907), gives a review of the etiology, diagnosis and treatment of the various forms of keratitis with loss of substance. With every ulcer, the simplest and the most virulent, the associated local or constitutional pathological conditions should be sought out and treated. Pilocarpin sweats and the salicylates exert a beneficial effect upon nearly every type. Copper sulphate is not to be used on trachoma granules when an ulcer is present, and sugar of lead is contraindicated in the presence of corneal abrasion. When tincture of iodine is used as a cautery, calomel should not be used, whether on the cornea, or internally. When using strong solutions of nitrate of silver, cocain should not be applied locally. (This also applies to solutions of bichlorid of mercury.—P. H. F.) Dionin was a disappointment, as far as clearing opacities is concerned, but a 5 per cent. solution of benzoate of lithium acts as a solvent for carbonate and phosphate of calcium which most opacities contain.

P. H. F.

REMARKS ON CORNEAL ULCERS, ESPECIALLY SERPENT ULCER.—ROSENHAUCH. (*Postop. ophthalmolog.*, 1907 and 1906.) The etiology of corneal ulcers has been materially elucidated by the bacteriological researches of Gasparini, Uhthoff and Axenfeld, who in the majority of cases ascertained the pneumococcus of Fraenkel-Weichselbaum. Later observers found also other microbes, as diplococcus Morax-Axenfeld, bacillus of pneumonia, streptococcus, bacillus subtilis and proteus, in very malignant ulcers, *B. pyocyaneus*, in marginal catarrhal ulcers, *B. Koch-Weeks* and *B. xerosis*. Ulcers and infiltrations of the cornea may also be caused by fungi. In the so far published cases of keratomycosis *aspergillus fumigatus*, *flavescens*, *niger*, *Wentii*, *candidus*, *muco mucedo*, *penicillium glaucum*, were found. The author reports on 56 cases of corneal ulcers from the clinic of Professor Wicherkiewicz at Krakau. In catarrhal ulcerations were encountered: *B. xerosis*, *staphylococcus albus* and *aureus*; in serpent ulcer pneumococcus, *staphylococcus albus*, *citreus*, *aureus*, *streptococcus*, *B. xerosis*, *diplobacillus Morax-Axenfeld*. As to treatment, Saemisch's section is hardly ever performed. The curative serum of Roemer has not proved successful. Only in extraordinarily malignant infectious processes cauterization or puncture of the cornea are resorted to. The best results are obtained with pyocetanin, applied, according to Wicherkiewicz, in connection with dionin.

K. W. M., translated by C. Z.

ULCERATIVE KERATITIS PROBABLY DUE TO TROPHIC CHANGE.—PANCOST, J. W., Philadelphia (*Ophthalmic Record*, March, 1908). The patient had been refracted some months previous to the present trouble, and vision and fields were normal in each eye. The keratitis was preceded by a foreign body found imbedded in left cornea. A region of three square inches including the eye had been painful for three days. The foreign body was removed and a collyrium of sodium hyposulphate ordered, with a capsule of strontium salicylate with camphor monobromate for internal use. The pain about the eye continued, the cornea became anesthetic, site of foreign body ulcerating. Spot cauterized with pure carbolic acid. The eye went from bad to worse until the entire cornea was involved by the seventh day, when it was enucleated. The vitreous was found to be fluid, retina completely detached and the chorioid partly, cornea destroyed down to Descemet's membrane, but there was not a particle of pus found in the eye. The author suggests as the cause, a trophic change due to the influence of the trigeminus nerve.

M. B.

THE TREATMENT OF INTERSTITIAL KERATITIS.—MARTIN, H. H., Savannah (*Jour. A. M. A.*, April 11, 1908), bases his paper on clinical observations in his own practice and that of thirty colleagues, and concludes that local measures, such as sub-conjunctival injections, massage, hot or cold applications, dionin, yellow salve, electricity, except for the alleviation of symptoms and complications, are of no value during the stage of infiltration and vascularization, while iodids are positively harmful. The treatment is the treatment of congenital syphilis, relief of local symptoms, and complicating uveal inflammation, and measures for the more rapid clearing of corneal opacities. Mercury is the drug par excellence and is best administered by inunction in doses sufficient to saturate the system and keep the patient on the verge of salivation. The dark-room is unnecessary and dangerous. On the contrary, the patient should have full outdoor liberty, with suitable protection from light. Milk and egg diet, stimulants in case of marked debility, and a generally strengthening régime, are of importance.

For the relief of pain and inflammation, hot applications, leeching and atropin are of use, but not as effective as in acute inflammations. Yellow salve, calomel powder, sub-conjunctival salt injections are used for the opacities, but these generally clear up best with vigorous constitutional treatment. In the discussion of this paper attention was called to the value of dionin in strong solution or even powder form, the good results obtained from mixed treatment, the danger of pushing mercurials in debilitated patients; the clinical observation of stubborn interstitial keratitis cut short by an attack of measles.

P. H. F.

A CASE OF NON-VASCULAR PARENCHYMATOUS KERATITIS. RECENT VIEWS OF ITS PATHOLOGY.—DAVIS, FREDERICK A., Denver (*Ophthalmic Record*, March, 1908). In order to sustain the point that parenchymatous keratitis may be both primary (not secondary to a uveitis) and non-vascular, a case is reported of a colored boy aged 19, who had normal vision when first seen, with spots of opacity in one corneal periphery which resembled flakes of snow in clear ice. The other eye soon became similarly involved, and the opacities traveled across the cornea. At no time was the corneal epithelium involved, nor was there at any time any iritis, ciliary or conjunctival redness or vascularity of the cornea. The process lasted four months, leaving clear cornea with normal vision.

M. E.

CHORIOID.

ON PUNCTIFORM ATROPHY OF THE CHORIOID AND PIGMENTATION. — GEBB, H. (From the eye clinic of Prof. C. Hess in the University of Würzburg. *Archiv fuer Augenheilkunde*, lix, p. 383.) A well nourished painter, aged 23, noticed that his sight began to fail about a year ago. Both eyes had V-fingers at 1 m., excentrically, central scotoma for white and colors, visual field not contracted, and presented the same ophthalmoscopic picture: optic disc pale with temporal conus, vessels normal. In an extent of three papillary diameters around the disc the chorioidal vessels were visible, but not at the periphery. The macula showed an intensely light spot with slight pigment border and, above and below, another one without pigment. At two to three papillary diameters from the disc towards the extreme periphery, the fundus was covered with innumerable yellowish white dots, partly with, partly without pigment borders, on some places confluent to elongated islands. The retinal vessels coursed over them. They bore no resemblance to typical or atypical retinitis pigmentosa, for which the family history gave no evidence, but more to retinitis punctata albescens. Although there were no positive symptoms of hereditary syphilis (acquired syphilis was denied), the case might be considered as a late form of hereditary syphilitic changes of the fundus. It was atrophy of the chorioid, apparently of the stroma of the chorioid and the pigment epithelium, which had started at the periphery. A colored plate illustrates the condition. C. Z.

GLAUCOMA.

DIAPHANOSCOPY IN GLAUCOMA. — WÜRDEMANN, H. V., Milwaukee (*Ophthalmic Record*, March 21, 1908). Glaucoma occurs in two forms, anterior and posterior glaucoma. Anterior glaucoma may be acute or chronic, primary or secondary. The primary may be due to increased secretion of aqueous, and increase of albuminous elements, or to sclerosis of the vessels causing obstruction of the iridic infiltration angle. Myotics or iridectomy act favorably in these cases. Posterior glaucoma is the chronic simple non-inflammatory type, is due to obstruction of the vorticle veins of the chorioid and is usually accompanied by general arteriosclerosis. Excessive pressure is mostly confined to the vitreous chamber. It is not materially affected by any local treatment, except possibly galvanism and ocular massage. Transillumination assists in the diagnosis in the anterior types. The diaphanoscope is applied to the sclera at the outer canthus. The pupil is lighted up and if the eye be looked at obliquely the ciliary body will appear as a

dark ring some few millimeters from the corneal margin, at which another dark ring appears caused by the root of the iris. Between these two rings is an illuminated area which corresponds to the circumlental space. It is usually about 3 or 4 mm. wide. It is enlarged during accommodation. It may be encroached upon or obliterated by changes in the size of the ciliary processes. A family tendency to a narrow circumlental space predisposes toward glaucoma. Diaphanoscopy is negative in posterior glaucoma unless the anterior chamber becomes smaller. M. B.

REPORT OF THE PATHOLOGICAL EXAMINATION OF A CASE OF ACUTE PRIMARY GLAUCOMA.—KNAPP, ARNOLD (*Arch. Ophthalm.*, March, 1908, xxxvii, 157), gives the macroscopic and microscopic findings in an eyeball enucleated for acute primary glaucoma.

Microscopical examination showed the anterior chamber obliterated and the iris totally adherent to the cornea. The posterior chamber was filled with a semi-opaque gelatinous mass and a similar coagulated fluid in the anterior part of the vitreous. No lesions were found in the blood vessels of the ciliary processes. The author believes the gelatinous substance, present in the posterior chamber and the anterior part of the vitreous, was an exudate and probably came from the ciliary blood vessels.

This exudate distended the posterior chamber, obliterated the anterior chamber and mechanically produced increase tension.

W. R. M.

GLAUCOMATOUS EXCAVATION OF THE LAMINA CRIBROSA WITHOUT EXCAVATION OF THE PAPILLA AND WITH MARKED PAPILLITIS, IN A CASE OF ACUTE INFLAMMATORY GLAUCOMA.—POSEY, BROWN, Chicago (*Arch. Ophthalm.*, March, 1908, xxxvii, 160), reports a case of acute inflammatory glaucoma in which an iridectomy had been done with only temporary improvement. Six months later a second operation was done and was followed by a severe iridocyclitis and the eye was enucleated. In the anterior part of the eye there was present the results of an inflammatory reaction of subacute type; posteriorly there was a marked papillitis, and a marked cupping of the lamina cribrosa, but no excavation of the papilla. The optic nerve showed atrophic and inflammatory changes.

As a result of both the clinical and pathological findings the author believes that there developed in the eye an acute inflammatory glaucoma followed by cupping of the nerve head; the accompanying tension did not cause complete atrophy of the nerve; after the second operation there was a kerato-irido-cyclitis and, as

a result of this, neuritis developed in the partially atrophic nerve; this caused a swelling of the tissues that gave the choked disc appearance.

The author believes the papillitis to be a purely accidental complication.

W. R. M.

VALUE OF TREATMENT IN GLAUCOMA SIMPLEX.—VON HIPPEL, Gottingen (*Die Ophth. Kl.*, Sept. 5, 1907), holds as dangerous the myotic treatment of glaucoma simplex. He always does a free iridectomy and never has seen important impairment of the visual function as an immediate result. His statistics include 58 patients with 74 glaucomatous eyes observed over a period of 14 years. Considering those cases as cured that showed no deterioration at the end of at least two years, he has a per cent of cures of 41. Of these there have been under treatment 12 from 2 to 5 years, 9 from 5 to 10 years, 6 from 10 to 14 years. These include some which had a marked contraction of the field and considerable excavation of the nerve head. As temporarily cured he includes 9 (14 per cent); 6 from 1 to 2 years; 3 less than one year without loss of function. In 17 eyes (27 per cent), in spite of iridectomy, there has been continued failure of vision, but not blindness; in 13 eyes (20 per cent), blindness in from 1 to 5 years. Sclerotomy has given no permanent results, but has been of value in iridectomized eyes.

In discussion, Stilling said that he does not operate when the contraction has reached or approached close to fixation, having had unfavorable results at this stage. He attributes von Hippel's favorable results to the fact that at the clinic consent is obtained to operate at an earlier period than in private.

Schreiber, Magdeburg, indorsed von Hippel's methods.

W. Z.

EMOTIONAL GLAUCOMA.—ANGELI (*La Clinique Ophthalmique*, October 10, 1908). Angeli reports a case in detail; it was that of a young woman of 25, who consulted him October 7, 1906. She complained of violent headache and called attention to the left eye; stated she had two days before, after having suffered a severe emotional trouble, observed a cloud before the left eye which increased so that by the next day vision was so much reduced she could not go about with that eye. Vision of the right eye was also somewhat cloudy. Examination gave left eye T. + 3; pericorneal and conjunctival injection; cornea too cloudy to allow of ophthalmoscopic examination; anterior chamber obliterated and iris in contact with posterior surface of the cornea. The pupil,

though seen with difficulty by oblique illumination, was normal in size and reacted to light. Vision reduced to counting fingers at 25 per cent. Right eye T. + 1. Patient saw colored circles about flame; anterior chamber diminished and vision 8/x. Pilocarpin azotate $1\frac{1}{2}$ per cent. four times daily. December 10, three days later, condition improved; left corneal infiltration had disappeared and anterior chamber re-established; tonus of left eye + 1. Visual field of each eye normal. Refraction of each eye H.A. Patient's eyes were practically normal December 12. On January 2, 1907, a slight attack of cloudiness of sight followed a discussion with patron. January 28 eyes again normal. February 6 a new attack equalling that of December 7. Treatment removed symptoms.

B. E. F.

INJURIES.

INJURIES TO THE EYES OF THE CHILD INCIDENT TO INSTRUMENTAL DELIVERY.—GREEN, JOHN, JR., St. Louis (*University Med. Jour.*, April, 1908), notes as one of the most frequent forms, an opacity of the cornea. This may be diffuse and transitory, or of a linear or irregularly striped aspect, and permanent, depending on edema of the cornea due to tears of Descemet's membrane. Buchanan has suggested that unilateral high grade astigmatism may be traumatic in origin. Fracture of the frontal bone and orbital roof may be due to direct pressure by forceps. Exophthalmus may be caused by compression of the skull or by a direct backward pressure of forceps, acting like the speculum which dislocates the globe in enucleation. Subconjunctival extravasations are usually accompanied by other injuries, as are hemorrhages into the anterior chamber. Optic atrophy may follow fracture running through the optic foramen. The lids may be bruised, cut, or partially torn off; even the globe may be gouged out. Traumatic cataract, oculomotor palsy, irido-dialysis, rupture of the chorioid, deep intraocular hemorrhage, have also been noted, all after the use of forceps in delivery. Not over 25 per cent. of recorded cases can be classified as severe. Minute retinal hemorrhages are rather common. Many injuries are found to have occurred in non-instrumental delivery, as after version, in face presentations, spontaneous deliveries, breech presentations, and so on. Considering that it is frequently a question of losing or saving two lives, a possible injury to the child's eyes can hardly weigh as a serious contra-indication to the use of forceps, but the grave possibilities should always be borne in mind. Any marks of violence to the eyes or ocular adnexa should lead to thorough examination.

P. H. F.

SHOT THROUGH THE ORBIT.—NEWOLINA, Apolinaria, St. Petersburg (from the eye clinic of Prof. E. Fuchs in the University of Wien, *Beiträge zur Augenheilkunde*, lxx, 1908, p. 584), reports an interesting case in a man, aged 44. There was instantaneous blindness without ophthalmoscopic changes, which gradually developed into atrophy of the optic nerve and narrowing of the blood vessels. From the symptoms and Roentgen photographs, the shot apparently entered the orbit between its inner wall and eyeball to the superior orbital fissure, along the osseous septum between this and the optic foramen, the cavernous sinus, above the Gasserian ganglion to the upper face of the temporal pyramid, where it became lodged. It injured the optic nerve, most likely the upper portion, in its avascular part, the ophthalmic branch of the fifth nerve, grazed its ciliary twigs, and contused the oculomotor and trochlear nerves.

C. Z.

TOTAL DISLOCATION OF THE EYEBALL THROUGH THE KICK OF A HORSE.—VON HIPPEL, A., Goettingen (Medical Society at Goettingen, *Deutsche Medizinische Wochenschrift*, 1907, No. 46, p. 1922). The patient did not lose consciousness, but walked directly after the accident for three-quarters of an hour, to the clinic. One and one-half cm. from the lateral commissure of the lids of left eye a gaping vertical wound, 4 cm. long, showed the bone. The upper orbital margin was torn off and 11 sequestra were found in the orbit. It was ascertained by palpation that the optic nerve was not torn. The ecchymosed lids were retracted behind the immovable, stretched eyeball, the internal rectus was torn off from the sclera, the epithelium of the cornea below the center scraped off, anterior chamber normal, pupil enlarged without reaction, eye totally blind. The lids were drawn back and the eyeball replaced, the internal rectus sewed on.

Optic disc pale, its borders indistinct, surrounding retina whitish gray, opaque, veins almost normally filled, arteries very thin, blood current partially interrupted, circulation in retina totally abolished. Healing took place with opacity of the cornea.

The ophthalmoscopic changes were of great interest, as they explained the cause of the complete permanent blindness of the left eye. Within the first two weeks the retinal circulation seemed to be restored to a certain degree, but after the third week the veins grew thinner, then all vessels on the disc had disappeared except two twigs; at the periphery were a few filiform vessels. The optic disc was white, a little opaque, the intense gray discoloration of the retina had somewhat cleared up. This showed that blindness

was due not to stretching of the optic nerve produced by the dislocation of the eyeball, but by a rupture of the central retinal artery, which gives the same ophthalmoscopic picture as embolism.

A weak transient circulation takes place by capillary anastomoses between branches of the posterior ciliary arteries and the central artery at the entrance of the optic nerve into the sclera. The scanty blood supply, by not being sufficient for the nutrition of the retina, a rapid necrosis of the inner strata follows, shown by the early occurrence of the diffuse opacity. This disappears after a few weeks with the absorption of the destroyed retinal elements and the development of atrophy, and the normal red color of the fundus reappears, on which the thickened walls of the more or less completely empty retinal vessels are clearly visible as white lines.

Exactly the same condition prevailed in this case. A simultaneous laceration of the ciliary arteries could be excluded, on account of the absence of pigment in the retina. According to clinical experiences and the experiments of Wagenmann, the separation of the ciliary arteries is followed by pathological changes of the chorioidal vessels, secondary affection of the pigment epithelium and immigration of pigment into the retina.

As to the mechanism of the injury von Hippel assumes that one point of the horseshoe must, after breaking the upper orbital margin, have entered the orbit between roof and eyeball. By the pressure upon the contents of the orbit from the temporal side, the globe was suddenly crowded forward and turned toward the temple with such force that the tendon of the internal rectus was torn. It was remarkable that the eyeball itself was not hit, as may safely be inferred from the lack of a rupture of the chorioid or hemorrhages into the vitreous.

C. Z.

OXID OF COPPER IN THE CORNEA. — RUST, EDWIN G., Cleveland (*Archives of Ophthalmology*, Vol. xxxvii, No. 2, 1908). The possibility of being struck in the eye with oxid of copper while walking or driving in the public highways did not exist until that period of the present age when the overhead trolley wire system was introduced into use as a means of conducting and applying the electric current as a motive power. As the wheel of the trolley pole runs over the plates of which the hangers and switches are made, there is always some combustion. Ordinarily this is invisible and insensible, but under any influence which makes poor or interrupted contact, the copper is detached, immediately oxidized, and thrown off in brilliant sparks. The substance of the sparks thus emitted is always oxid of copper, when there is some

mechanical abrasion on the wire or on the hanger, in which instance the spark substance consists of either pure copper from the wire, or a poor grade of bronze from the trolley wheel. The substance of these sparks occasionally strikes the cornea, and always becomes deeply imbedded.

A lady came to my office suffering acutely from "having just been struck in the eye by a spark from a trolley wire" as she was "driving her automobile alongside a street car which was running under a number of intersecting wires."

On examination I found a brownish-black circular body about 1 mm. in diameter, smooth on its outer surface but with its under side raggedly spreading into and beneath the corneal epithelium. To the contact of my instrument the foreign substance seemed like half rotten rubber. It was very clinging and difficult to remove, the substance seeming unusual to me. I submitted the foreign body to an expert for examination. He found it to be oxid of copper.

Since this case my records show that twenty-six other persons have come to me with oxid of copper in the cornea. Twenty-five came with the statement of having "been struck in the eye by a spark from a trolley wire." One, that "he had in his eye a spark which flew from the wire of a traveling electric crane." In four cases the copper had been imbedded in the cornea for more than a week before the patients had consulted me. In none of these cases was there any tendency to ulceration.

Oxid of copper is a body which does not scratch, as it is smooth, and often is almost buried beneath the epithelial cells. The ciliary injection, pain, and photophobia are intense, until every vestige of the copper is removed. Oxid of copper must have been in the past few years frequently removed from the cornea, and perhaps its character, composition, and mode of formation recognized; but so far as my research extends, it has not hitherto been reported or described. I have reported these cases more as a matter of scientific interest than of clinical value.

H. V. W.

PIECES OF COPPER IN THE VITREOUS. REFLEX IMAGES OF THE LENS IN RAINBOW COLORS.—ERTL, FRANZ, Klagenfurt (*Centralblatt fuer praktische Augenheilkunde*, 1907, p. 322). One and one-half years previously a piece of a gun cap had struck the left eye of a man, aged 24. A red foreign body of metallic luster, of the size of the head of a pin, was seen behind the lower portion of the lens, floating on movements of the eye. Downward and laterally from the optic disc wavy and spotted configurations shining like gold could be followed up to the macula, which was covered

with glittering dots, arranged in the area of a polygon, about one-third of the papillary diameter wide. On oblique illumination a gray opacity, apparently in the anterior strata of the lens, was noticeable, which disappeared when examined with transmitted light. The posterior, and faintly the anterior, images of the lens appeared in vivid rainbow colors.

Under cocain anesthesia a piece of copper, 1 mm. square, was removed by Dr. Purtscher through scleral section with iris forceps in daylight and the conjunctiva closed by three sutures. Recovery with V. = 3/xxiv. Under Hertnack's loupe the gray opacity was seen to be composed of small granular pieces and presented the anterior image of the capsular epithelium (Hess). A disturbance of color sense remained; yellow was taken for white, light green for blue and dark blue for black. The peculiar rainbow color of the reflex images of the lens may be explained by the well-known lattice spectra, for which the rays, reflected from the posterior capsule, respectively the posterior and anterior cortices of the lens, served as sources of light, or as interference phenomenon, analogously to Newton's rings or those produced by two thin glass plates pressed upon one another, by different refractive indices of a thin stratum of the lens from those of the capsule and the whole lens.

A case of Goldzieher is quoted in which a piece of copper was lodged in the retina for ten years, and which showed similar phenomena, as, e. g., the apparent disc shaped opacity of the anterior strata of the lens.

Probably these, as well as the changes of the retina, the impairment of vision and anomalies of the color sense, were caused by disturbances of the nutrition of the lens and damages to the inner tunics from the permanent chemical irritation of the copper on the ciliary body and iris, "chalkosis retinae," according to Goldzieher. C. Z.

ON SOME INTERESTING INJURIES OF THE EYE BY FOREIGN BODIES.—KÜMMEL, R. (From the eye clinic of Prof. Oeller, in the University of Erlangen. *Zeitschrift fuer Augenheilkunde*, xix, January, 1908, p. 36.) A piece of copper from a gun cap was quietly lodged in the posterior portion of the eyeball of a boy for three and one-half years. After two light intercurrent attacks, a severe inflammation developed, with hypopion and bulging of the iris, on which the foreign body became visible and was removed by iridectomy. V. = fingers at 3 m. Apparently it had been loosened by the suppuration. The favorable course in this case, in

concordance with the experiments of Leber and the observations of Kostenitsch, justifies the advice not to enucleate at once an eye, injured by copper, but to attempt the immediate extraction of the foreign body.

Another case is reported, in which a shot migrated after one and one-fourth years from the interior to the sinus of the anterior chamber, from which it was extracted, with almost normal vision.

In a few other cases of injuries by shots the results were not as favorable. Although lead, which as shot generally enters the eye aseptically, is relatively well tolerated, it is frequently followed by detachment of the retina or formation of folds. KümmeI therefore advises removal, if possible.

In Case 8, pieces of sandstone were spontaneously extruded through small abscesses formed at the scleral wound. V. = 5/vii. Generally stones penetrating into the eye lead to destruction by suppuration and atrophy due to infection. If aseptic, they may be tolerated. This has been frequently observed in the anterior segment of the eye, where they usually remain on account of their lesser penetrating force. Their occurrence in the posterior parts and extrusion from them are very rare. C. Z.

NAIL FROM A SHOTGUN CARTRIDGE, WHICH SPONTANEOUSLY CAME OUT FROM UNDER THE EYELID, WHERE IT HAD BEEN LODGED FOR EIGHT YEARS, WITHOUT ANY DAMAGE TO THE PATIENT.—FERNANDEZ, J. SANTOS, Havana (*Arch. Ophth.*, March, 1908, xxxvii, 168), reports a case of injury from the explosion of a shotgun cartridge, the nail from the cartridge entering the upper lid near the outer canthus. The entrance of the foreign body was not suspected and the patient complained of no discomfort during the eight years that the foreign body remained imbedded. Shortly before the spontaneous expulsion of the cartridge nail the patient had a feeling of uneasiness and slight pain in the upper lid. No inflammatory reaction followed. W. R. M.

CONTRIBUTION TO INJURIES OF THE EYE BY EXPLOSIVES.—WITALINSKI (*Postep okulistyczny*, 1907, No. 1). In many cases of injuries in which we know or assume that a foreign body penetrated the eye we are inclined to attempt its immediate removal. If it is iron or steel, this may be accomplished without danger with the electro-magnet. Our task is much more difficult if a piece of copper entered the eye. In such cases it is more advisable to abstain from any procedure, as the changes which develop

in the eye may facilitate and simplify matters, as the following case shows, which was observed in the eye clinic of Prof. Wicherkiewicz: A piece of a capsule had penetrated the sclera above the cornea into the anterior chamber. At first it was covered by a dense infiltration which extended towards the pupil. After the infiltration had become smaller, under atropin, thigenol salve and alcohol dressings, the piece of copper was seen at the lower sinus, whence it was easily removed through a small section at the sclero-corneal junction.

K. W. M., translated by C. Z.

FOREIGN BODIES IN THE EYEBALL.—MORRISON, F. A., Indianapolis (*Indiana Med. Jour.*, Vol. xxvi, No. 3), reports nine cases. Those in which there was a firm clot of blood enveloping the foreign body, as shown by direct inspection previous to operation, were all failures, as far as removal of the foreign body was concerned, and necessitated enucleation. Those imbedded in the lens, retina, or iris are apparently more easily removed. The incision made by the surgeon is safe. In only one instance was there any subsequent trouble, viz., local retinal detachment, and in no case serious loss of vitreous. Notwithstanding the well-known tendency of copper to produce suppuration, one case of this sort recovered after having harbored a piece of copper for a whole year. By bringing the magnet in contact with the globe of the eye at different points, the presence of pain may indicate the position of a particle of iron or steel, which could not be seen with the ophthalmoscope. (A very misleading test, as pain may be absent even if there is a foreign body in the globe, and the pain point, when present, is by no means an accurate guide to the foreign body. An x-ray picture is the only reliable indicator, not only when the foreign body has not been seen, but even where it is visible to the ophthalmoscope. P. H. F.) The operation of opening the globe and the introduction of the magnet can be painlessly done under ordinary cocain anesthesia.

P. H. F.

DOUBLE PERFORATION OF THE EYEBALL BY METALLIC FOREIGN BODIES.—SHUMWAY, E. A., Philadelphia (*Ann. Ophthalmol.*, October, 1907). The case is reported of a man aged 39 whose cornea was penetrated by a large piece of iron, which passed through the eye and lodged in the orbit alongside the optic nerve, and finally caused such an active ophthalmitis with meningeal symptoms that the eye was enucleated and the foreign body removed. The value of the x-ray as a means of determining the exact location is extolled. If the body is just outside the sclera and in Tunnar's

space it may be possible to secure it with the magnet, but if it is outside the capsule it is unlikely that it can be thus secured and a Kronlein operation will then afford a safe means of securing it.

M. B.

TRAUMATIC IRIDEREMIA.—FAITH, THOMAS, Chicago (*Ann. Ophthalmol.*, October, 1907). Three cases are reported, two of which had corneal ruptures with iris excision shortly after the injury. The other case did not have corneal rupture. The lens was dislocated into the vitreous. In all the cases the anterior chamber was filled with blood for several days. The prominent symptoms in all the cases was increased tension, which was combated by the use of eserin.

M. B.

COLLAPSE OF THE SCLEROTIC DURING AN OPERATION FOR CATARACT.—ROUX (*La Clinique Ophthalmologique*, January 16, 1908). While corneal collapse during cataract extraction is not infrequent, collapse of the sclera is rare. The patient was 32 years old, myopic, antecedents normal and whose health had always been good. Operation of extraction May 11, 1907. Incision and iridectomy normal; during cystotomy, cornea became depressed and an air bubble entered the anterior chamber; no loss of vitreous; the whole eye was soft; the sclera became sunken and folded as if the eye contents had been expelled; cataract delivered by aid of curette. At first dressing it was found that the corneal wound had healed without iritic hernia and all trace of collapse gone.

Chodin, at the St. Petersburg Congress in 1893, reported two similar cases.

B. E. F.

THE USE OF CHEAP HAMMERS AS A FACTOR IN PENETRATING WOUNDS OF THE EYE, WITH ILLUSTRATIVE CASES.—AYRES, S. C. (*The Lancet-Clinic*, March 28, 1908), concludes, from investigation made, that the oculist should "show mechanics the danger from cheap hammers, and urge them to purchase better tools." One variety of cheap hammers is made from a low carbon tool steel, and only their outer shell is tempered. The authority referred to by the writer also describes another process, where for tempering, is substituted the application of cyanid of potassium, followed by immersion in cold water. He believes that repeated blows of the hammer separates the metal beneath from this shell, allowing the latter to crack and chip off. An all-steel hammer costs about \$1.25, but the workmen buy a cheaper grade. The writer carefully records eight cases in which the eye was penetrated by a fragment of metal, in six of which cheap hammers

were entirely responsible, partly responsible in the others. He warns not only against cheap hammers and hatchets, but also against cheap chisels.

M. D. S.

DIAGNOSIS AND TREATMENT OF COMMONER INJURIES OF THE EYE.—GAMBLE, W. E., Chicago (*Ill. Med. Jour.*, March, 1908), calls attention to infection as the great danger in penetrating wounds, especially those of the cornea, which generally heal promptly if clean. Fluorescein, 2 per cent. solution, and the use of oblique, focal illumination, with a strong convex lens, are valuable aids in examination. Small abrasions are frequently the source of infected corneal ulcers, especially when blennorrhoea of the lacrimal sac is present. Proper irrigation and a protective bandage will generally effect a cure in a day or two. Small particles of glass may easily escape detection unless fluorescein is used. If ulcer develops it should be cauterized with 95 per cent. carbolic acid applied on a toothpick. In lime burn, removal of the particles is the most important procedure, to be followed by cocaineized vaselin. The Haab magnet is recommended for removing magnetizable foreign bodies.

P. H. F.

INSTRUMENTS AND METHODS.

ADDITIONAL OBSERVATIONS ON THE USE OF THE OCULAR TRANSILLUMINATOR (THE WÜRDEMANN LAMP).—WÜRDEMANN, H. V., Milwaukee (*Ophthalmic Record*, April, 1908). Ocular transillumination was at first used to differentiate between simple retinal detachment and that due to sub-retinal tumors. It has since been found to be of value in determining the size of the circumferential space which is smaller than normal in glaucoma and in eyes so predisposed. For oblique illumination of the anterior part of the eye it is superior to the use of the lens usually employed. In operating for the removal of foreign bodies, for discission of cataract, and even for cataract or iridectomy, the focal illumination afforded by the instrument is superior to other means because of no heat, the light is concentrated and the instrument is not in the way. The gross anatomy of the iris is well shown, as well as swelling, exudates, lack of pigment, the thickness of pseudomembranes, the extent of synechia, the size and position of lenticular opacities, the condition of tumors or foreign bodies behind and in front of the lens, are all well shown. It is a necessary adjunct to the dark room examination. The instrument is made mostly of hard rubber and is about the size of a fountain pen. At one end is a miniature lens-capped lamp of 5 c. p., which is in contact

with a glass rod which passes on out of the instrument, terminating in the end which is placed against the eyeball. The wires from the battery enter at the other end of the instrument. M. B.

A SIMPLE AND EFFECTIVE INSTRUMENT FOR CAUTERIZING CORNEAL ULCERS.—TODD, FRANK C., Minneapolis (*Ophthalmic Record*, April, 1908). A modification of Wordsworth's cautery instrument. It consists of a handle and shank with a copper ball at the end of the latter, which has a platinum point extending from it at an angle. The copper ball holds the heat so that the point is hot enough to cauterize the cornea for several minutes.

M. B.

AN IMPROVED RETINOSCOPIC MIRROR.—BRADBURN, A. A., Edinburgh. (*Ophthalmic Record*, March, 1908). The well-known double mirrors which are hinged together for protection are fitted with a triangular carrier behind the sight hole. This carrier is fitted with a + 2.D and + 4.D lens, and a center hole which is unglazed. They can be rotated at will over the sight hole of the mirror, and are of advantage because of giving increased magnification and lessen the distance at which the observer has to stand from the eye of the patient.

M. B.

A NEW PTERYGIUM KNIFE.—YOUNG, H. B., Burlington, Iowa (*Ophthalmic Record*, March, 1908). This knife has a kidney-shaped blade, set on the shank like a keratome. It has a rounded end instead of a sharp point. They are made right and left, and have double cutting edges, one convex, the other concave. It is possible to shave a pterygium from the cornea smoothly, and deep set eyes can be reached with ease.

M. B.

A KNIFE GUARD TO AID IN THE TARSALE SUBSECTION.—EWING, ARTHUR E., St. Louis (*Ophthalmic Record*, January, 1908). An additional illustration is presented, showing more fully the method of suturing the conjunctiva into the bottom of the wound made by the subsection of the tarsus and the tying of the sutures upon the skin surface. He has added to the instruments used in performing his entropion operation a knife devised by Dr. Green, provided with a guard which serves to keep the incision throughout its full length an even distance from the margin of the lid. M. B.

ON THE UNRELIABILITY OF THE GIANT MAGNET AS TO DIAGNOSIS, WITH REMARKS ON KOSTER'S PROTECTIVE ARRANGEMENT FOR THE SIDEROSCOPE.—ASMUS, E., Düsseldorf (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, 1908, 1, p. 262), says, that as much as the general introduction of the giant magnet is to be

hailed as a therapeutic progress, the superficiality in using it for diagnostic purposes is to be regretted. Forty-three of his patients felt pain when the giant magnet was employed, while 14 showed not the least reaction. Therefore a negative reaction to the giant magnet does not indicate that there is no foreign body in the eye. In all these 14 cases Asmus' sideroscope revealed distinctly the presence of iron, which was extracted.

One tragic case is reported in detail, in which Roentgen rays, giant magnet and sideroscope in a large clinic gave negative results. After a year, when the patient came to Asmus, vision was reduced to 6/xxiv. Asmus located the seat of the piece of iron with his sideroscope and extracted it.

In order to obtain reliable registrations of the sideroscope, the following directions must be observed: The apparatus must be well fixated. The magnetic needle must always be hung free. It must be magnetized every year. The foreign body must be made magnetic by influence in the right sense. The cocainized eye must be skilfully approached to the glass tube of the needle. For localization of intensely magnetic pieces the damping needle must be employed. If maximal deviation is lacking, the examination must be made with the telescope. For further details Asmus refers to his monograph.

The device of Koster to obviate the disturbing influence of electric street railways on the magnetic needle of the sideroscope (reviewed in OPHTHALMOLOGY) is endorsed as a correct solution of this calamity. Asmus considers the sideroscope, kept in good order, indispensable for the diagnosis of the presence of iron hidden in the interior of the eye.

C. Z.

ON THE DIAGNOSIS OF INTRAOCULAR PIECES OF IRON. JUNG, J., Coeln (*Klinische Monatsblätter fuer Augenheilkunde*, 1908, xlv, 1, p. 271). Sideroscopy requires a great deal of devotion and patience and, on the other hand, includes certain sources of error which, if ignored, may lead to wrong diagnoses. This is illustrated in two cases. In the first, a piece of iron, lodged in the cheek from a former injury, caused a misleading reaction of the sideroscope, but was detected by Roentgen rays. In the second case the sideroscope indicated that a large foreign body in the eye, disclosed by Roentgen rays, must be iron, whereas all attempts to extract it with giant and hand magnets failed. The eye was later on enucleated on account of cyclitis, and the foreign body proved to be an alloy of copper and zinc, which frequently contains iron.

Jung shows the great value of the sideroscope in cases in which the giant magnet failed, for giving the negative proof that no iron is in the eye. The most dangerous cases in that respect are those in which the foreign body entered laterally through the sclera and which do not at once come under treatment. Jung saw five cases of blindness from siderosis in which the foreign body had been overlooked. This would have been avoided if sideroscopy had been employed, which afterwards yielded maximal deviations. If the registrations of the sideroscope are too indefinite, Roentgen rays must be resorted to. C. Z.

TECHNIQUE FOR THE LOCALIZATION OF FOREIGN BODIES IN THE EYE.—BOWEN, C. F., Columbus (*American Quarterly of Roentgenology*, Vol. 1, No. 4), has modified the Sweet apparatus so that the patient may lie down, the head being firmly held with sand bags, a compression diaphragm being used, and the plates changed without disturbing the apparatus. The balls of the Sweet localizer are so arranged that they can be raised and lowered on an upright post which is attached to a lead weight. The diaphragm of the compression cylinder is placed above the head in such a way that the light from the tube is thrown through the head directly over the two balls. After the first exposure the cylinder is moved about three inches towards the patient's body, and tilted so that the light will again pass through the balls. Plotting is done on the usual chart, ruled in the millimetre scale. For locating pieces of steel, a tube of high penetration is used. In cases of suspected glass in the eye, where the x-ray examination gives a negative result, the technique is checked by placing small fragments of the same kind of glass to the side of the eye and making a second exposure. If these test pieces show, and the first set of pictures shows nothing, we are sure that no glass is present.

P. H. F.

A SIMPLE AND RAPID MEANS OF TESTING THE EXISTENCE OF BINOCULAR VISION.—ROCHE (*Annales d'Oculistique*, January, 1908), takes a plain surface, such as a common blotter, 30 cm. or so square, places a small object, such as a roll of paper or a bread crumb, 25 cm. from its edge, and, holding it horizontally at the height of the eyes with one of its borders in contact with the bridge of the nose, closes one eye and with the other fixes the small object. He then attempts to touch the small object with the point of a pencil held perpendicularly to the plane. It will not be possible to do this with one eye, though it is easy to do so with both. In a one-eyed person the error will be in the straight line joining

the eye with the object and never to the right or left of it. He thinks the experiment will be of use in detecting monocular simulation.

(G. O. H.)

GENERAL DISEASES AND THE EYE.

SOME SYPHILITIC AFFECTIONS OF THE EYE AND EAR. RYANSON, G. STERLING, Toronto (*The Canada Lancet*, March, 1908). Syphilis is a cause of many eye diseases. There is no part of the eye which may not be invaded by it; even the lens is affected indirectly by interference with its nutrition; but it seldom causes complete blindness. Cohn, among 20,000 patients, found 1.15 per cent. of syphilitic eye disease, and Coccia 1.16 per cent. in his clinics.

Chancre of the eye is occasionally met with. It usually sits *a cheval* on the margin of the lid, partly on the skin and partly on the conjunctiva. It presents, when fully developed, the usual appearance of the Hunterian chancre, though during the early stage it is difficult of diagnosis. The pretracheal lymphatic glands become enlarged and indurated, constitutional symptoms manifesting themselves in due course. During the secondary period mucous patches are sometimes observed on the conjunctiva, and during the tertiary period ulcerations of the eyelids have been observed.

It is the iris, however, which is the most common seat of ocular syphilis. It is attacked in 4 per cent. of all cases (Juler), and from 30 to 60 per cent. of iritis is due to syphilis (Webster Fox). The secondary stage is the time when it usually manifests itself, and during the first six months after infection. It may occur as early as the sixth week, or appear as a late tertiary symptom. Hutchinson states that after the sixth month the liability to iritis diminishes rapidly. The inflammation is plastic in character, and attended by free exudation during the secondary stage, but later is attended by one or more gummata. I have seen the anterior chamber so filled with gummata that a diagnosis of keratitis was made. It is a peculiarity of syphilitic iritis that it is attended by little or no pain, although there are exceptions to the rule, the patient, when only one eye is affected, often being able to pursue his occupation. The signs of iritis are: Cloudy aqueous, change in color of iris, loss of luster of the iris, iritic zone of congestion, contraction of the pupil. The symptoms are: Dimness of vision, lacrimation, photophobia and more or less pain. The duration, under favorable circumstances, is from four to six weeks. The prognosis is favorable under suitable treatment, although iritic

adhesions are of frequent occurrence. Gummata will dissolve and disappear under mercurialization, though I have seen them suppurate, with consequent loss of the eye.

The treatment consists in the free exhibition of mercury, best administered in the form of inunction, one dram rubbed in twice daily. Iodid of potash is of no use in this stage of the disease. Locally, atropin is the main standby. Leeches to the temple, followed by one drop of a 3 per cent. solution of atropin instilled into the eye usually gives relief. The subconjunctival injection of cyanid of salicylate of mercury, with acoin, is most useful in subacute cases or cases resisting other treatment.

Keratitis sometimes occurs in acquired syphilis, though this is disputed by some. The interstitial keratitis of hereditary syphilis is beyond dispute. It usually manifests itself under the latter conditions, about the period of puberty, and is characterized by progressive ground-glass opacity of the cornea, beginning in the center and extending slowly in the periphery. Both eyes are usually affected. There is some photophobia, lacrimation and pain, but the symptoms are not usually acute. It is usually accompanied by iritis, and presents the iritic zone of congestion. The duration is from nine to twelve months. The prognosis should be guarded, as permanent impairment of vision, short of blindness, follows in most cases. Occasionally the cornea clears up entirely, but the sight remains impaired by accompanying chorioiditis.

Chorioiditis and rhinitis are late secondary or early tertiary symptoms. They present little or no external congestion of the eye, some photophobia, progressive deterioration of vision, which the patient described as smoky. With the ophthalmoscope a fine haze may be seen, but usually no large floating opacities in the vitreous. I consider this fine haze as pathognomonic of syphilitic retino-chorioiditis. I have never seen a case of syphilitic retinitis without chorioidal involvement and I doubt its existence. Later on pigment changes and atrophic spots appear in the chorioid. The prognosis is favorable to the extent that blindness rarely follows, but some defect in the vision is sure to occur. The treatment is the exhibition of mercury, by inunction, by mercurial baths or by administration by the mouth. Locally the subconjunctival injection of the cyanid of mercury, atropin, leeches to the temple and rest of the eyes favor a cure.

Atrophy of the optic nerve is occasionally the result of syphilis more commonly in connection with locomotor ataxia.

The paralytic affections of the ocular muscles are frequently of syphilitic origin. The most common form is a temporary paresis of the iris and muscle of accommodation, which comes on quite suddenly, and passes off gradually. After several attacks, paralysis of the external eye muscles frequently occurs, those supplied by the third nerve being especially involved. These paralytic affections occur from fifteen to twenty years after infection, mostly in cases in which the secondary symptoms have been slight or indefinite. Complete ophthalmoplegia may occur. After one or two attacks the paralysis becomes permanent. F. A. AND P. G.

SOME CLINICAL OBSERVATIONS ON THE DIAGNOSIS AND TREATMENT OF EXOPHTHALMIC GOITER.—JACKSON, J. M., and MEAD, L. G., Boston (*Boston Med. and Surg. Jour.*, March 12, 1908). In the course of an interesting article on this disease the writers give the following observations concerning the ocular symptoms: "Next to the thyroid, heart and circulation, the eyes are of chief interest in exophthalmic goiter, and in this series of 85 cases the eyes were negative or unnoted in eight. In 20 cases the four cardinal signs, exophthalmos, von Graefe's lid sign, Stellwag's and Moebius' weak convergence were all present. Exophthalmos, von Graefe's and Moebius' in 8. Exophthalmos and von Graefe's in 8. Exophthalmos and Stellwag's in 10. Exophthalmos and Moebius' in 4. Exophthalmos alone in 20. Reflex winking was sometimes lessened, as was also the wrinkling of the forehead in looking up, but neither of these seem important symptoms." C. H. M.

TETANUS AFTER INJURY OF THE EYE.—WICHERKIEWICZ (*Praca ep okulistyczny*, 1907, No. 2). This is very rare. Wicherkiewicz could find only three observations (of Schultz, Ramivo-Guedes and Goehring) in literature. He observed the following case in June, 1903: The right lower lid of a boy, aged 15, was injured by the point of a stick. Three days later a contused wound of the skin, 2 cm. long, with purulent discharge, was seen at the lower orbital margin. Lower lid and cheek were swollen. The wound was carefully washed with a solution of boric acid, painted with 10 per cent. ichthyol salve, and covered with paper dressing. The next day trismus sets in, and the patient was transferred to the department of infectious diseases, where a subcutaneous injection of 20 c. cm. tetanus serum was made. The attacks of trismus, however, grew more violent and almost constant, in spite of injections of morphin and chloral hydrate. Two further subcutaneous and intravenous injections did not save the patient from death.

Wicherkiewicz gives a review on our present knowledge on tetanus and its morbid agent from the meritorious works of Nikolskier, Kitasato, Vaillard and Ellbogen. The best prophylactic is still the thorough and careful cleansing of the wound with a reliable antiseptic. The curative serum frequently is disappointing, its manufacture ought to be improved and its application and dosage more carefully investigated.

K. W. M., TRANSLATED BY C. Z.

Eye SYNDROME OF DEMENTIA PRECOX.—TYSON, H. H., and CLARK, L. PIERCE, New York (*Jour. A. M. A.*, May 2, 1908), review the literature for evidence that this mental disease has an auto-toxic foundation, and report on 115 cases with characteristic ocular symptoms. These are fundus changes, consisting in pallor of temporal side or of the whole disc, indicating atrophy, or signs of peri-neuritis with congestion. The latter, shown by blurring of the disc margin, may disappear under treatment of the intestinal autointoxication by cathartics, intestinal antisepsis, baths and regulation of diet, but the central edema and transitional pallor does not diminish. The pupils are generally larger than in normal individuals (of corresponding age. The pupils of the presumably young patients were compared with those of the physician and attendants, who were in all probability at least ten to twenty years older. The difference of little more than 1 mm. is easily explained by the youth of the patients. P. H. F.) The visual color fields were practically abolished, being markedly contracted concentrically. Corneal sensibility was diminished in about 80 per cent. The severer degrees of eye change are found in the more rapidly deteriorating cases.

P. H. F.

THE EYE SYMPTOMS IN HYSTERIA.—MEYERS, D. CAMPBELL, Toronto (*The Canada Lancet*, May, 1908). Of all the protean manifestations of hysteria, none are more remarkable than those which affect the eye. The various functions of this organ are so dissociated by hysteria that a study of its symptoms here, in doing away with one function while sparing another, shows a cleverness that even the greatest physiologist might envy. Hysteria can effect every possible dissociation in the complicated functions of vision. First, it may obliterate at once the whole of the visual function, which is the most radical and the least common result, producing as it does total blindness. Second, it may cause the visual function to disintegrate, dividing and subdividing it into its elementary components, and thus affording a beautiful example of how

composite functions are decomposed. This latter we can observe especially in the study of the visual fields. While total blindness is uncommon, its actual existence has for a long period been recognized.

In the recent work of Professor Janet he relates a case where the amaurosis remained complete for two years, after which vision rapidly returned to normal. The writer refers to two cases of complete double amaurosis observed by him; in one the condition remained for several months, when sight was gradually restored; in the other the blindness remained complete for three years and nine months. It then began to improve and in six weeks the visual fields were normal and the vision perfectly restored.

An error in diagnosis would often be averted by a careful physical examination, conjoined with the use of the ophthalmoscope. The frequent absence in these cases of the corneal or conjunctival reflex should put a physician on his guard, notwithstanding that the pupillary reflexes to light and accommodation may be perfect.

In the second group are found affections of the external ocular muscles producing ptosis, strabismus, etc., about which there are as many complications as about vision itself. Again, the internal muscles, particularly those of the crystalline lens, may be affected and the function of accommodation become dissociated. From the spasm of accommodation may result many most remarkable disturbances, such as monocular diplopia, macropsia, etc. At times objects are seen double by a single eye, which from the point of view of optics is quite paradoxical; again, they are seen too large or too small, or deformed in various ways. Professor Janet relates instances in his "*Névroses et Idées Fixes*," in which objects appear too large or too small in one of their halves only, and quite normal in the other. Again the disturbance of the visual field is a most important symptom.

The examination of the visual field of an hysteric will often demonstrate a remarkable fact, which probably exists *only* in this neurosis, viz., a concentric contraction of this field. The extent of the simultaneous vision becomes smaller, so that instead of being from 60° to 90° in extent for white, it is almost circular at 20° to 30° or even less. A further change also frequently takes place in that there is a reversal of the fields for red and blue, so that the field for red, instead of being the smaller, is equal in size or larger than that for blue. Another remarkable phenomenon is that in proportion as the field for white contracts, the fields for the other colors gradually become more restricted and are finally, if the contraction for white is extreme, "squeezed" out of the

center, in the order above named, the violet being first obliterated.

The writer reports a case which illustrates the characteristic hysterical disturbance of the field of vision.

F. A. AND P. G.

OCULAR SYMPTOMS IN TABES DORSALIS.—PLANT, Hannover (*Die Ophth. Kl.*, Sept. 5, 1907), noted the following ocular conditions in a woman with tabes: Pupil dilated ad max. and fixed; total paralysis of the sinister movements and of convergence. Paralysis of the upward movement and horizontal nystagmoid movements of the left eye. The papilla in the right eye was pallid over its temporal half. The visual fields were of normal size with a small central scotoma for green. The author believes that the optic nerve condition was not due to the tabes but that there was a complicating basal meningitis of syphilitic origin. W. Z.

OPHTHALMOSCOPIC LESIONS IN A CASE OF AMAUROTIC FAMILY IDIOCY.—DUPUY-DUTEMPS (*Annales d'Oculistique*, February, 1908). The patient was the eleven-months-old child of Russian-Polish Jews. An older brother, seven years old, was normal. A second child, born five years before, presented at five months of age, symptoms similar to those of the patient and died when two and a half years old. The patient developed normally until three months old, when an arrest of development was noticed. His expression was dull, his look vague and his head drooping. His limbs were weak, though not paralyzed, and their movements were rare and objectless. The thinness of the thorax contrasted with the fat of the inferior extremities. He made frequent starts on the occasion of a sudden noise or jar. He followed a light with his eyes and recognized large objects, but, though there was no strabismus or limitation of the movements of the ball, the eyes did not converge upon a fixed point, showing a high degree of amblyopia. The ophthalmoscope showed symmetrical lesions of the macular regions. These regions presented a circular patch of a uniform chalky whiteness like that of an atrophied papilla. It was a little larger than the papilla and was limited by a rather sharply defined contour. There was no appreciable elevation. In its center, corresponding to the fovea, was a rounded spot of a dull red color: an image corresponding exactly to the description given by Tay.

This disease, which was first described by Warren Tay (1881), has not been reported before in France. It commences at about the age of four or six months and manifests itself at first by intellectual apathy, progressive muscular feebleness and defect of vision.

It seems to be a racial disease, as nearly all its subjects are Jews of Russian or Polish origin. Finally, the intellectual apathy ends in idiocy, muscular weakness progresses to paralysis and the amaurosis becomes total. The child becomes marasmic and rarely lives more than two or three years.

According to Tay, the macular lesion appears about six months after the commencement of the disease and persists afterwards without modification. Later the disc becomes atrophied. The condition is bilateral and symmetrical.

The lesions in this disease extend throughout the whole cerebro-spinal axis, involving the cerebral cortex, the central nuclei and the anterior horns of the spine in degenerative changes. In the retina the ganglionic cells present alterations similar to those found in the cortical cells. The permanent ophthalmoscopic image, so constant in its existence, its form and its localization can be due only to a modification equally permanent of certain fixed elements of the retina; the known and well defined lesions of the ganglionic cells.

In the greater part of the retina these cells are spread out in a single layer and more or less spaced, so that their alteration can not noticeably affect the general tint of the fundus. But in the region of the macular they are crowded together and superimposed in a number of layers in a circular zone corresponding exactly in position and extent to the image described by Tay. This thickened layer of cells becomes opaque and completely masks the red tint of the chorioid, while in the center of this region—the fovea—the ganglionic cells are absent and the retina retains its transparency, allowing the color of the chorioid to appear.

G. C. H.

LEPRA OPHTHALMICA IN CEYLON.—DESILVA, W. H., Colombo, Ceylon (*Ophthalmoscope*, February, 1908), says: "My conclusions with reference to lepra ophthalmica in Ceylon are that the commonest specific lesions are found only in lepra tuberculosa, but even in this condition, the percentage of cases so affected is small. In only 23 out of the 30 examined for eye affections was there any specific pathological condition. In these cases the adnexa, supercilia and cilia were affected from almost the very early stages of the disease; followed in a certain number of cases by an episcleritic infiltration which secondarily involved the cornea and iris. The amount of useful vision left even in the later stages of the disease is remarkable. There was no specific involvement of the fundus in any of the cases that were capable of examination.

Fields and color vision were examined in a majority of the cases without detecting any abnormality. Tension was affected only secondarily. I have little doubt, even in the few cases that had a marked diminution of vision, that early surgical interference would have resulted in preventing, or at any rate in delaying, an involvement of the pupillary area, and thereby preserving useful vision for a longer period."

In *lepra anesthetica* there were no primary lesions in the eyes; deterioration or loss of vision was due to a secondary traumatic affection of the cornea, owing to carelessness on the part of the patients in carrying out the instructions of the physicians or nurses to protect their eyes whenever there were signs of lagophthalmos.

The few cases of cataract seen in both varieties of *lepra* were, comparatively, not above the average seen in this class of Cin-galese. M. B.

THE CONNECTION BETWEEN INFLAMMATION OF THE PAROTID GLANDS AND IRITIS.—ADAMS, P. H., London (*Ophthalmoscope*, February, 1908). Two cases are reported, one a woman of 26, the other a man of 65, who had iritis following parotitis, which subsided with the glandular inflammation. The woman had a very septic mouth from decayed teeth, which were treated with improvement to the glandular and ocular conditions. M. B.

LACRIMAL APPARATUS.

IMPERFORATION OF THE LACRIMONASAL DUCT IN THE NEWBORN AND ITS CLINICAL MANIFESTATIONS.—WILLIAM ZENTMAYER, M. D., Philadelphia.—The paper a clinical one. Recognition of the condition of comparatively recent date. Development of the lacrimonasal canal. Etiology. Several causes for the symptoms usually designated as "congenital dacryocystitis." Most common one, imperforation of the septum between the lacrimonasal canal and the nasal cavity. Complications and sequelæ. Purulent conjunctivitis and lacrimal abscess. Symptomatology. Not complex. Bacteriology. Great variety of micro-organisms found. Prognosis. Usually good. Danger of lacrimal abscess and of infections of corneal lesions. Possible relation to dacryocystitis in childhood. Diagnosis. Presents no difficulties. Confounded with ophthalmia neonatorum, catarrhal conjunctivitis, and prelacrimal cysts. Treatment. Because of the danger of complications expectant treatment is deprecated. Probing or syringing recommended; preferably the former. Probing not difficult, as no marked resistance is met with, and consequently the danger of a false passage is slight. W. Z.

DACRYOCYSTITIS IN THE NEWBORN.—OLLENDORFF, *Erkrankungen Ophth. Kl.*, Jan. 20, 1907), calls attention to the fact that owing to its widely different etiology from the same affection in adults, dacryocystitis in the newborn calls for entirely different treatment. It is almost universally conceded that in the newborn the trouble consists in a congenital atresia of the inferior end of the lacrimonasal duct.

A study of 8 cases in 7 children showed that in only 2 was there at first any suppuration of the sac. In all of the others there was either a conjunctival catarrh or a purulent inflammation. In one case the conjunctival affection was unilateral and on the side, which later showed pus in the sac; in 2 cases, bilateral, but markedly worse on the side which later showed pus in the sac; in 1, bilateral with subsequent unilateral pus in the sac. In these 6 cases with apparently primary catarrhal conjunctivitis the association of tear-sac trouble occurred once on the tenth day of treatment; once on the fourteenth; once on the twenty-second; twice on the twenty-eighth, and once on the thirty-ninth. In spite of the clinical signs the author is confident that the sac affection was primary and the conjunctival affection secondary, because in 3 cases the eye, which later showed sac disease, was either worse affected or the only eye affected, and the purulent conjunctival inflammation was cured so soon as the disease of the sac was eradicated; where both were affected the stubborn conjunctival inflammation subsided when the tear-duct disease was cured. Only in one case, where bilateral conjunctival inflammation was followed four weeks later, by bilateral dacryocystitis, does the author believe the sac affection to have been secondary, as even after the sac affection had been cured the conjunctival inflammation subsided very slowly.

While the author believes the lesion in all but the last case to have been due to atresia, he noted in one case bare bone in sounding, but this, he thinks, might have been due to massage, which had been employed previously to his having seen the case. Only 2 cases were cured without probing; 6 with probing. The author believes that expression and massage should not be persisted in for more than eight days. Only in extremely poorly nourished infants would the non-use of probes be indicated. He has always found but one probing necessary.

For tuberculous purulent inflammation of the sac extirpation is the only rational treatment.

W. Z.

HISTORICAL AND CLINICAL CONTRIBUTION TO THE TREATMENT OF DACRYOCYSTITIS BY THE FORMATION OF A NEW PASSAGE THROUGH THE UNGUIS.—LAGRANGE and AUBARET (*Annales d'Oculistique*, September, 1907). This mode of treatment is now completely abandoned and almost forgotten. The end sought by the ancients in puncturing the bone and the nasal mucous membrane was entirely different from that sought by more modern surgeons. The perforation to make a passage for the tears was not, properly speaking, performed until the eighteenth century. Before the sixteenth century—the time of Vesali and Fallopius—the anatomy of the lacrimal passages was not understood. Galen was one of the few ancients who recognized the lacrimal puncta, but he regarded them as glandular orifices which directed a secretion towards the conjunctiva, and this view was maintained even after the discovery of the lacrimal sac, until the eighteenth century.

The unguis was perforated to give exit to pus. Caries of the unguis was thought to be the cause of the obstinate suppuration, and Galen, Paul of Eginus and Celsus advised its cauterization with the hot iron. To understand the success that the ancients obtained, in spite of complete ignorance of the anatomy and physiology of the lacrimal apparatus, we must suppose that they destroyed the lacrimal sac with the cautery, or that they established a drainage by perforation of the unguis. The Arabs of the middle age reproduced the proceedings of the ancients, and Albucasis advised perforation of the unguis with the actual cautery. Jean de Vigo perforated the unguis "*ut sanies per nasum fluat.*" Even after the anatomical description of Fallopius in 1561 the erroneous ideas of Galen persisted for some time. Fallopius, himself, thought that the sac secreted a lacrimal humor, and that the greater part of the tears came through the lacrimal puncta. Maitre, Jean—1701—first asserted that lacrimal abscess was due to obstruction of the passage. Woolhouse, before puncturing the unguis, removed the lacrimal sac. After penetrating the unguis he placed a tent in the opening, and later replaced it by a canula of gold, silver or lead.

Treatment by catheterization is a method of drainage by the natural passages. This sometimes ends in complete recovery with reestablishment of lacrimal permeability, but this is not so frequent as is sometimes supposed.

The treatment of dacryocystitis by the creation of an artificial passage through the unguis is also a method by drainage—a drainage more or less permanent which gives time for the lac-

rimo-nasal mucous membrane to recover. The authors maintain that without abandoning catheterization, it is well, in certain cases in which this treatment fails to procure appreciable results, to form an artificial passage for drainage that can be probed if necessary, and maintained open or be reopened if it closes, and that this procedure should not be entirely abandoned.

They perform the operation as follows: First. Incision of the skin as for extirpation of the sac. Second. Recognition of the anatomical relations of the orbicular tendon and the inner angle of the orbit, and separation of the inner wall of the sac from the lacrimal groove. Third. Opening through the lacrimal groove. Fourth. Free excision of the inner wall of the sac in the region of the opening in the bone, and Fifth. Section of the wound.

They think that this procedure may sometimes render unnecessary the complete sacrifice of the lacrimal apparatus.

G. C. H.

SOME NOTES AND OBSERVATIONS ON THREE HUNDRED AND TEN CONSECUTIVE OPERATIONS FOR EXTIRPATION OF THE LACRIMAL SAC.—ELLIOTT, MAJ. R. H., Madras, India (*Ophthalmic Review*, February, 1908). The writer gives the following indications: (1) Dilatation of the sac; (2) purulence of the sac contents; (3) evidence of previous attacks of phlegmonous dacryocystitis with the presence of stricture; (4) a history of long-standing obstruction, combined with an inability or unwillingness on the part of the patient to submit to a long course of the probe treatment; or with a timidity that renders it unlikely that such treatment will be persevered in; (5) the presence of any indication for an operation on the globe of the eye (especially cataract); (6) the presence of a septic ulcer in the eye of the same side; (7) any factor, occupational or otherwise, which increases the liability of the patient to eye injury; (not a few of our cases, in Madras, of septic ulcer of the cornea occur amongst fitters, goldsmiths and stone-masons; in all of the above, and many allied trades, tiny chips of hard substances frequently fly up and injure the cornea); (8) the existence of double lacrimal obstruction, with evidence of past or present mischief in one cornea, is a strong indication for the removal of both sacs.

Next the steps of the operation are described in full. After removing the sac, as large a probe as possible (Nos. 9 to 12 Theobald) is thrust down the nasal duct till stopped by the palate, pushing any mucous membrane in front of it, then followed by

a red-hot spindle-shaped cautery, to insure the destruction of this membrane. The removed sac is examined under water, and the cavity carefully inspected to make sure that no part has been left behind; if any portions have been so left they are dissected out; if necessary, the neighborhood of the dome of the wound is cauterized freely with a ball-shaped red-hot cautery. The case is dressed on the seventh day, when the stitches are removed.

Discussing the difficulties and complications met with during the operation, the writer advises that the terminal branch of the facial artery be avoided in the first incision, since such division would cause troublesome hemorrhage. When the lacrimal sac is not dilated or distended, it is not uncommonly bound down into the lacrimal groove by a dense fascia, which appears to be a backward reflection from the tendo palpebrarum. When 'the bridge of the nose is high, and the orbits deep-set, the operator may be embarrassed and burrow outward into the orbit, mistaking a lobule of fat for the sac; such an accident need never happen if the wound is held well open, all hemorrhage stopped, the nasal margin of the lacrimal groove well defined with the finger, and the dense fascia cleanly divided as close to this bony edge as possible; the sac is at once seen lying within its sheath of bone and fascia. Hemorrhage may be dealt with by firm pressure, aided, if need be, by a touch with a pointed cautery over any bleeding spot; if from the nasal duct after the passage of the probe, it may be controlled by plugging, and, after cleaning and drying, by rapidly passing a spindle-shaped cautery down the passage. When one desires to perform a cataract extraction or other serious operation on the globe of the eye, and the lacrimal passages are found (as tested by dropping fluorescein into the conjunctival sac and examining a handkerchief into which the patient has strongly blown his nose) to be closed, even though there may be no very obvious retention, the writer thinks that it is better to remove the sac before undertaking the more serious intraocular operation. He does not consider the use of paraffin to define the limits of the sac necessary; if the cavity does not look clean, or there is doubt as to the thoroughness of the operation, it is best to assume that the sac has not been entirely removed, to inspect thoroughly, and to remove boldly any suspicious part. Of a large number of cases it was deemed necessary to operate a second time on account of a portion of the sac wall having been left behind, in only one instance.

Regarding the complications met with after the operation he enumerates the following: (1) Recurrence of retention, due to

a portion of the sac wall having been left behind at the operation; (2) failure to obtain primary union of the wound, or breaking down of the wound after primary union appeared to have been established; (3) progress of the septic ulceration of the cornea for which the operation was undertaken; (4) a chronic catarrhal condition of the lower lid, which is difficult to treat, but which yields eventually to patient treatment along the ordinary lines; it is better not to be too active.

The average time consumed in operation was 12 minutes, the shortest $4\frac{1}{2}$ minutes, the longest 50 minutes. In 71 per cent. of the cases the sac was removed entire.

Finally the writer discusses the question: What becomes of the excessive lacrimal secretion after removal of the sac? It is to be borne in mind that the nervous supply of the gland, of the passages, and of the intermediate irrigated region (the cornea and the conjunctiva) is from one and the same source; it is therefore only natural to suppose that if we remove a source of constant irritation in the shape of inflamed passages we rid the whole lacrimal system of the previously existing irritation and excitation. Whether this explanation be right or wrong, one thing at least is certain, viz., that the extirpation of the sac is practically invariably followed by an immediate diminution of lacrimal secretion; in a large number of cases, as has been seen, this happy result appears to be permanent.

C. H. M.

LENS.

ON MITTENDORF'S LENS-SPOTS.—GIFFORD, H. L. *Optical Note* (*Ophthalmic Record*, March, 1908). Since Mittendorf's second article in 1906, the author has made a record of the cases he has seen showing the spot on the posterior capsule just to the nasal side of its center. In approximately 1,500 cases he found the spot on one or both eyes of 31 patients, or about 2 per cent. In 4 cases they occurred in both eyes, and in those in which only one eye was affected 12 showed it in the right eye, and 15 in the left. The author agrees with Mittendorf that they are caused by remnants of the hyaloid artery.

M. B.

CONTRIBUTION TO THE CHEMICAL CONSTITUTION OF THE LENS.—GROSS, OSCAR. (From the eye clinic and the physiologic institute in the University of Würzburg. *Archiv fuer Augenheilkunde*, lviii, p. 40.) A number of lenses of cattle were triturated with quartz and infusorial silica to a dough. The juice of this, a clear yellowish fluid, obtained through a hydraulic press under

1,500 atmospheres, showed alkaline reaction, and contained minute quantities of albumen, viz., nucleoproteid, sulfuric acid and chlorin.

To ascertain the constitution of the ashes, Gross used human cataractous lenses. The solution of ashes reacted neutral and contained SO_4 , chlorin, chlorids, calcium, sodium and potassium.

C. Z.

COLOBOMA OF THE LENSES AFTER RUPTURE OF THE ZONULA.—ISAKOWITZ, J. (From the eye clinic of Prof. H. Schmidt-Rimpler in the University of Halle. *Archiv fuer Augenheilkunde*, lix, p. 373.) A man, aged 18, presented on both eyes a coloboma of the lens corresponding to an artificial coloboma of the iris. The iridectomies were performed for leucoma adherens after blennorrhoea neonatorum, when the patient was 10 weeks old. Isakowitz found in one eye a rupture of the zonula which most likely occurred, as well as on the other eye, during the operations, and he believes that subsequent partial release of tension allowed the elasticity of the growing lens to produce a flattening of the border at this point. The growth of the lens was here arrested and led to a notch. It measured 1.5 mm. and corresponded to half the difference of the diameters of the lens of a new born child (6 mm.) and of an adult of 18 (9 mm.). For the congenital colobomata of the lens Isakowitz adopts the explanation of the C. Hess, viz., that some of the vessels of the fetal vascularized lens capsule persist longer than normally and, by their pressure on the lens, mechanically impede its growth. C. Z.

LIDS.

A SPECIAL INFECTION OF THE FREE BORDERS OF THE EYELIDS (MEIBOMIAN STREPTOTHROCOSIS).—CASTELAIN (*Annales d'Oculistique*, October, 1907). Twelve years before little nodules of variable size had appeared at different points of the lower left eyelid and, after some time or under pressure, discharged a yellowish mass. At the end of eight or ten months the disease in this eye disappeared and a year later appeared in the right eye in greater intensity. For eight years there were always these nodules in different degrees of evolutions.

The morphological character of cultures from the discharge refers to the microbe found to the variety of streptothrix described by Axenfeld.

This is the first time that a lesion determined by this bacillus has been noted in the region of the eyelids, but some cases of

palpebral actinomycosis have been reported, and the author thinks in some of these a complete bacteriological examination might have shown the streptothrix, which clinically closely resembles the actinomyces. G. C. H.

CONTRIBUTION TO THE SURGERY OF THE EYELIDS.—STAINZ.
(*Annales d'Oculistique*, February, 1908). A new suture for the palpebral conjunctiva consists in passing the threads through the whole thickness of the lid and tying them over a little roll of gauze upon the skin. The author claims for this suture that it prevents irritation of the ball by the knot and enables the surgeon to remove the stitch without everting the lid.

An operation for senile ectropion is a modification of Snellen's suture operation. A cataract knife is inserted through the skin just below the outer canthus and passed, with its cutting edge downwards, immediately under the conjunctiva to the region of the internal canthus. Then the bundle is raised, and in withdrawing the knife, a deep cut is made in the subconjunctival tissue into which the conjunctival fold is drawn by the suture. G. C. H.

MATERIA MEDICA AND THERAPEUTICS.

ON THE DIAGNOSTIC VALUE OF ESERIN IN PUPILLARY DISTURBANCES.—KRUSIUS, F. C. (From the eye clinic of Prof. L. Bach in the University of Marburg. *Zeitschrift für Augenheilkunde*, 1907, xviii, p. 442.) According to the experiments of P. Schultz on animals, eserine acts on the nerve endings in the sphincter muscle and thus produces miosis. The sphincter pupillæ could not be excited by eserine only from the nerve. This suggested the use of eserine as a means for the diagnosis of localization: If the central neuron is affected, i. e., the oculo-motor nerve from its nucleus downward to the ciliary ganglion and upward to the cerebral cortex, the ciliary nerves and their endings in the sphincter muscle will be intact and a prompt miosis upon eserine is to be expected. If the peripheral neuron from the ciliary ganglion to the muscle is affected, two possibilities must be distinguished: 1. If the ciliary ganglion and the ciliary nerves are damaged, eserine will at first produce miosis, as long as the nerve endings in the sphincter have not yet been reached by the descending degeneration. 2. If the muscle itself is affected eserine will not effect miosis.

Krusius applied this method on 19 cases, given in tabular form, in some of which the localization had been ascertained from other clinical symptoms, but no reliable results were obtained.

In some the comparison between rates and degrees of miosis after weak doses of eserine in the healthy and the affected eye of the same person seemed to be of greater diagnostic value, and is recommended for further tests on a larger material.

Miosis was observed after instillations of 1/10 per cent. solutions of eserine in all his cases of peripheral paralysis from ruptures of the sphincter, showing that lesions of the sphincter by ruptures do not cause absolute paralysis. C. Z.

VALUE OF ATROPIN AND HOMATROPIN CYCLOPLEGIA.—GRATIOT, H. B., Dubuque (*Iowa Med. Jour.*, xiv, No. 5), pleads for the more general use of atropine. It is a reliable cycloplegic in all cases, allowing an accurate determination of the full static refraction, permits of more time in which to make one or more thorough examinations while the accommodation is completely paralyzed, and enforces ciliary rest, a decided benefit. Toxic symptoms are not rare, but can be guarded against. Conjunctivitis is seen, as a rule, only after prolonged use. Homatropine is more convenient, and reliable in about 75 per cent. of the cases.

P. H. F.

COMPARATIVE POTENCY OF HYOSCIN AND SCOPOLAMIN IN REFRACTION WORK.—REBER, WENDELL, Philadelphia (*Jour. A. M. A.*, April 25, 1908), uses homatropine semi-occasionally, and atropine infrequently. During the last six years he has seen upwards of 2,000 cases of refraction error in private practice, and has used a 1/10 per cent. solution of hyoscin hydrobromate, containing also 1/5 per cent. cocaine. In about one case in fifty there is rather marked flushing of the face, quickening of the pulse and some slight vertigo, but not more than is sometimes seen with homatropine. Not once was pronounced "toxemia" noticed. Compression of the canaliculi immediately after instillation will prevent even the slightest constitutional reaction. The solution is instilled once or twice the evening before, and twice the morning of the examination. For office use cocaine 2 per cent., warmed, is instilled, and the hyoscin dropped in, also warm, twice at intervals of a half hour. An hour later the testing may begin. Accommodation is sufficiently re-established for ordinary purposes at the end of 48 to 60 hours. It is not wise to attempt to hasten this by instilling eserine, as the benefit of the rest under a mydriatic is thus forfeited. The ideal would be to completely paralyze accommodation and put the internal ocular structures

at perfect rest by atropin prior to testing the refraction, but "the tension of life in this year of grace 1908" makes it impossible, for practical reasons.

P. H. F.

FRICTION IN CHRONIC AFFECTIONS OF OCULAR APPENDAGES.—LEWIS, D. H., OQUUWA (*Iowa Med. Jour.*, *xiv*, No. 5), has had good results with the methods of Leekernik, of Lodze, who uses glass balls ranging in size from 5 to 10 mm., with a short shank to be fitted into an aluminum handle. In trachoma of chronic type, the eye is cleansed and sterilized, filled with sterile oil or ointment, and the ball slipped between the lid and globe, and friction begun by to-and-fro or by circular motion lasting two minutes. This is repeated daily, or on alternate days. In indolent ulcers of the cornea, the globe is held with fixation forceps to prevent rotation. In old marginal blepharitis, the lids are everted and held by broad, blunt forceps, allowing friction directly to the margin of the lid and the base of the follicles. Old scars of the cornea are greatly benefited by friction combined with subconjunctival saline injections, all such scars being removed by absorption except those due to injury, and even these were improved as to sight. Old granular conjunctivitis is met in a most effective manner by friction. No medicaments are used, antiseptics being applied merely for the sake of cleanliness.

P. H. F.

ADRENALIN WITH COCAIN IN CATARACT EXTRACTION.—HUBBERT, CAL. H. (*Ophthalmoscope*, March, 1908), finds that the adrenalin increases the action of the cocain and renders bloodless the making of a large conjunctival flap. It causes an increased dilatation of the pupil, which should be counteracted by the use of eserine after the operation. Saline solutions should be instilled during the operation to prevent undue drying of the cornea.

M. B.

ARGYROSIS DUE TO THE USE OF ARGYROL.—KRAUSS, F., Philadelphia (*Ophthalmic Record*, March, 1908). A child of 4 years who had purulent dacryocystitis was given a 20 per cent. of argyrol to drop in the eye twice daily. It was used 20½ months. The ocular and palpebral conjunctiva became colored a bluish green tint.

M. B.

ACOIN IN AN OIL COLLYRIUM PRODUCES A PROLONGED ANALGESIA OF THE HUMAN EYE.—DARIER (*Le Clinique Ophthalmologique*, January 10, 1908). The writer states, with the discovery of cocain, it at first was hoped that it could suppress pain

provoked by any pathological condition, but the hope was not realized. Acoïn in aqueous solution, 1 to 40, according to Troll-denier, will bring anesthesia in the rabbit which lasts more than 24 hours; but its action in that form upon the cornea and conjunctiva unfortunately is *nil*, and if subconjunctivally applied its effect is only of a few hours' duration. Why there is so great a difference in length of effect between the cornea of a rabbit and that of a man can only be explained by the impenetrable human corneal epithelium. Darier has used an ointment of acoïn and thus produced analgesia for several hours; but this application is at first somewhat painful. In the *Klin. Monatsblätter*, December, 1907, Pflugk extols an oily collyrium of 1 per cent. acoïn as a remarkable analgesic; he has tried it in one hundred cases. Darier states that acoïn has the advantage of not paralyzing the accommodation, and of not dilating the pupil as does cocain; nor does it alter the corneal epithelium, which membrane becomes absolutely free from pain. The effect is instantaneous.

For the purpose of stopping the burning sensation of powdered dionin it is only requisite to apply a few drops of the oily acoïn.

Pflugk has seen no ill effects from the remedy used in oil; the pain following wounds, and that from iritis, disappears at once, the analgesia lasting from twelve to twenty-four hours. Two per cent. acoïn in oil produces a marked burning effect.

Darier concludes that we have thus an ocular analgesic which is active and harmless.

B. E. F.

ON THE POSSIBLE USE OF ATOXYL AND OTHER PREPARATIONS OF ARSENIC IN SYMPATHETIC OPHTHALMIA, TRACHOMA AND SOME SYPHILITIC AFFECTIONS OF THE EYE. A SUGGESTION.—GIFFORD, H., Omaha, Neb. (*Ophthalmic Record*, March, 1908). Atoxyl is a combination of arsenic and anilin, and is found to be of value in the treatment of all diseases caused by a protozoon rather than a bacterium, such as sleeping sickness, relapsing fever, syphilis, malaria, etc. In view of the possible causation of sympathetic ophthalmia by a protozoa the author tried atoxyl in two cases, and apparently with success. In one case, however, its value was questionable because of the simultaneous administration of large doses of sodium salicylate. The possibility of trachoma being caused by the protozoa leads the author to suggest that atoxyl might be used with benefit both internally and locally in this disease. Atoxyl is a powerful poison and in large doses has usually caused blindness, therefore it is to be used with care.

The author gave 30 minims of a 10 per cent. solution injected subcutaneously, at first twice a week, then every other day, till 18 grains in all had been given. M. B.

A CONTRIBUTION TO THE STUDY OF THE THERAPEUSIS OF ATOXYL IN OCULAR SYPHILIS. IRITIS CURED IN FIVE DAYS.—BARGY (*La Clinique Ophtalmologique*, October 25, 1907). The case reported by the author was in a subaltern officer of nervous temperament, thin and pale; he had acquired syphilis in the colonies. In July, 1907, he consulted Bargy, and complained that the vision of right eye had gradually lessened. Examination revealed an iritis. Having had rheumatism, for which salicylate of soda was given, that was now ordered with atropin locally. On July 17 there was no amelioration and left eye became involved. July 18 an intramuscular injection of half a gram of atoxyl was given at 8 a. m. and all other treatment suspended. On July 20 injection of another half gram of atoxyl. July 22, better, and a third half gram was injected. On July 24 all symptoms had disappeared. B. E. F.

NON-DIPHTHERITIC PURULENT AND PSEUDOMEMBRANOUS OPHTHALMIA CURED BY ANTI-DIPHTHERITIC SERUM.—FROMAGET (*Annales d'Oculistique*, September, 1907). The brilliant results which anti-diphtheritic sero-therapy has given in serious cases of pneumococcal keratitis have induced the author to try it in purulent ophthalmia due to the same infection. He reports two cases of purulent ophthalmia due to the pneumococcus in which sero-therapy gave results as remarkable as if the disease had been diphtheritic, and thinks that this serum must have other virtues than its specific properties—what Darier calls non-specific sero-therapy. It possesses the power of increasing the resistance of the organism to localized affections which are perhaps more numerous than we suppose. As the same results have been obtained with anti-tetanic serum, he suggests the possibility that it may be the property of the serum of the horse, and that the serum of the non-immunized horses might be effective. G. C. H.

THE USE OF STAPHYLOCOCCIC VACCINE IN THE TREATMENT OF HYPOPION-ULCER.—GREY-EDWARDS, H., Bangor, England (*Ophthalmoscope*, February, 1908). Three cases are reported of hypopion-ulcer which resisted all treatment, including subcon-

conjunctival injections of cyanid of mercury, which healed quickly after the injection, in the back, of a vaccine of dead staphylococci.

M. B.

SUPPLEMENTARY REPORT ON A CASE OF PROBABLE CEREBELLAR TUMOR TREATED BY TUBERCULIN INJECTIONS.—YOUNG, H. B., Burlington, Iowa (*Ophthalmic Record*, April, 1908). This case has been reported several times before. So far as the brain lesion is concerned the case stands cured two years after the process began. The retinal changes from the neuro-retinitis have left little in the way of visible lesions behind. The vision is 3/lxx.

M. B.

POTASSIUM IODID AND THE EPITHELIUM OF THE LENS.—PELUGK (*Wiener Medizinische Wochenschrift*, March 14, 1908). Iodid of potash was recommended in incipient cataract. The author experimented with rabbits, treated with naphthalin; two hours after the administration of this drug there were found changes in the epithelium of the anterior capsule of the lens. When potassium iodid was injected into the conjunctiva of these animals, the epithelial changes in the lens took place several hours later.

J. G.

UTROTROPIN IN NIGHT BLINDNESS.—MALLANNAH, H., India (*Brit. Med. Jour.*, Feb. 22, 1908). The writer calls attention to the important part which defective nutrition plays in the production of night blindness; his patients were all children found in an orphan asylum, the ages ranging from 8 to 12. The dry and foam-like condition of the conjunctiva near the margin of the cornea, known as xerosis, was noticed in two cases only, and was also seen occasionally in children who were not suffering from night blindness. A peculiarly muddy-colored pigmentation of the conjunctiva around the inner and outer margins of the cornea was, however, observed in 11 out of 12 cases; this seems to be of some importance in the diagnosis of the disease, and the writer detected night blindness in two children whose parents were not even aware of the complaint, by observing this phenomenon, which may be termed conjunctivitis pigmentosa. This pigmentation is due to the irritation of the conjunctiva with particles of dust, as it is found only in the exposed portion of the conjunctiva and never in the part covered by the lids. The diminished lacrimal secretion and the diminished sensitiveness of the conjunctiva are also factors essential in its production. The whole pathology of night blindness is embraced in two words, namely,

torpor retinae. He believes torpor retinae, xerosis, and conjunctivitis pigmentosa are nothing but the effects of the diminished alkalinity of the blood, and that the night blindness is easily cured by the internal administration of urotropin. He considers this drug as a specific in this troublesome complaint. Most of his cases got well completely in a week.

C. H. M.

THE OPHTHALMO-TUBERCULIN REACTION IN CATTLE.—McCAMPBELL, E. E., and WHITE, D. S., Columbus (*Jour. of Exper. Med.*, March, 1908), report a series of experiments showing a characteristic conjunctivitis with fibrinous exudation, coming on from 6 to 8 hours, reaching a maximum in 16 to 24, and disappearing in 48 hours. The reaction is more marked in animals which have not been recently tested with tuberculin. The local reaction inhibits repetition for from six weeks to a year. After tests with subcutaneous method, the ophthalmic reaction is only slightly reduced in intensity, and may serve as a test in cattle who will not react a second time to injections, or who have been injected in order that they may clear a test.

No constitutional disturbance was noted, such as rise in temperature, loss of appetite, or falling off in the production of milk. The question of relationship of intensity of reaction to the number and severity of tuberculous lesions, that of comparative accuracy, and the possibility of deciding by the reaction how far the tubercular process has progressed in the body, have still to be determined.

P. H. F.

THE OCULAR TYPHOID REACTION.—HAMBURGER, WALTER W., Chicago (*Jour. A. M. A.*, April 25, 1908), reports 48 cases. By the instillation into the eyes of typhoid patients of one drop of an extract of the typhoid bacillus, a reactive inflammation has been caused which is probably specific and possibly universal. In diseases other than typhoid, a less intense and shorter reaction occasionally appears which in most cases may easily be differentiated. These results agree closely with those obtained with the alcoholic precipitate of Chantemesse.

P. H. F.

ON OPHTHALMO-REACTION.—BRONS, C. (From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg i. B., *Klinische Monatsblaetter fuer Augenheilkunde*, xlv, 1, 1908, p. 60.) After a review on the literature of ophthalmo-reaction, which so far has almost exclusively been used in internal medicine, Brons reports on his experiences with it on diseased eyes. A great number of chronic inflammations of the eye, especially of

the sclera and uvea, present such indifferent symptoms that their eventual tuberculous nature cannot be recognized, although, as proved by W. Stock (reviewed in this volume of *OPHTHALMOLOGY*), many of them are due to tuberculosis. Therefore a reliable diagnostic test would be of inestimable value. Cases of clinically distinct tuberculosis being not at disposal, the reaction was studied on cases of chronic iridocyclitis, scleritis, keratitis, chorioiditis, and on cases which certainly were not tuberculous, as perforating injuries, serpent ulcers, etc. The results are arranged in tabular form. In 9 out of 24 suspected eyes, the ophthalmo-reaction was positive, the probatory injection of tuberculin in 14. The latter never failed when the ophthalmo-reaction had been positive. Positive ophthalmo-reaction allows the conclusion that somewhere in the body of the patient a tubercular process is active. The degree of reaction does not indicate the tuberculous nature of the eye affection, else only tuberculous eyes would give a severe reaction. This is not correct, since perfectly healthy eyes may give to the severest kind of reaction. In answering the question whether in ophthalmo-reaction there is a local reaction on the eye in the same sense as it may occur after subcutaneous injection of tuberculin, Brons states that this did not take place in most of the diseased eyes he examined, the reaction being limited to the conjunctiva.

In concordance with other authors, Brons therefore says: The tuberculous nature of an eye disease cannot be inferred from the course of the ophthalmo-reaction. If it is severe, or if the diseased parts participate in it, tuberculosis is probable; if it is mild, it is no proof against tuberculosis. On the other hand, if the subcutaneous injection is followed by a positive general or local reaction, the ocular affection is certainly tuberculous. Here lies the advantage of the subcutaneous method, which is given preference by Brons, as well as by Morax, Kalt and others. The influence of ophthalmo-reaction on the existing ocular affection is of great importance. If the ophthalmo-reaction was severe, its influence was deleterious. In 6 cases the disease was extraordinarily aggravated and the healing protracted. Brons therefore warns against injudicious instillations of tuberculin into diseased eyes. He does not generally condemn ophthalmo-reaction as, e. g., Kalt and Pes, but considers it, if carefully employed, as a valuable diagnostic means. He gives preference to the subcutaneous injection because it acts more certain, eventually determines, through local reaction, the tuberculous character of a suspected

eye affection, and such bad complications are not observed, in spite of high temperatures, if the original directions of Koch are adhered to.

Brons' essay gives a very lucid presentation of the whole subject and is very much worth while reading. C. Z.

OPHTHALMOLOGICAL OBSERVATIONS ON OPHTHALMO-REACTION WITH TUBERCULIN.—WALDSTEIN (From the eye clinic of Prof. A. Elsehnig in the German University of Prag. *Klinische Monatsblätter für Augenheilkunde*, xlv, 1., 1908, p. 285), used $\frac{1}{2}$ per cent. "tuberculin test" from the Institute Pasteur at Lille and reports on its effects on healthy and diseased eyes, no matter whether the individuals were healthy or tuberculous.

I. Healthy eyes: Out of 83 cases, 59 did not react at all, 14 slightly, 9 in a medium degree, 1 very strongly, in form of ordinary conjunctivitis, traumatic conjunctivitis, swelling of the palpebral conjunctiva with chemosis, ecchymoses and free secretion. In about a week the irritation disappeared.

II. Diseased eyes, (1) not influenced by tuberculin injection: In 6 cases of keratitis from hereditary lues no, or very slight, reaction. In 6 cases of iritis and cyclitis of varying etiology no reaction. Two cases of tuberculosis of the iris reacted only by increased injection of the previously reddened conjunctiva. A case of lupus of the conjunctiva was perfectly refractory to the instillation. (2) Eyes influenced by instillations of tuberculin: Out of 8 cases of eczematous keratoconjunctivitis 7 reacted positively with intense irritation, swelling and loosening of the sclero-corneal junction, typical phlyctenæ at the ocular conjunctiva, limbus and the previously clear cornea. Old corneal maculæ became infiltrated and formed ulcers. In a case of tuberculosis of the cornea with scleritis, sclerotizing and parenchymatous keratitis, the whole cornea became, after a second instillation, densely gray, with prominent infiltrations, and threatened to be destroyed by suppuration. Twelve out of 13 eyes with follicles in the conjunctiva reacted positively, with edema and ecchymoses, also 6 out of 9 cases of chronic catarrh and 3 cases of trachoma in the cicatricial stage.

Waldstein's tests showed a marked influence of the condition of the conjunctiva on the manner, intensity and duration of the reaction. It was much more severe on the diseased than healthy conjunctiva. Those not versed in ophthalmology may, by overlooking a slight follicular or chronic catarrh, draw wrong conclusions from the intensity of reaction. Waldstein therefore warns

against the general employment of ophthalmic-reaction for diagnostic purposes. He thinks it not improbable that tuberculin instillations of low concentrations may have a therapeutic effect, especially on eczema of the eye, since the irritation caused by tuberculin may generate antibodies which have a specific action on the disease, entirely different from irritations caused by other agents.

C. Z.

THE CONJUNCTIVAL TUBERCULIN REACTION IN THE DIAGNOSIS OF EYE DISEASES.—NANCE, W. O., and SWIFT, G. W., Chicago (*Jour. Ophthalm. and Oto-Laryng.*, February, 1908, ii, 43), have used the Calmette ophthalmic-reaction test for tuberculosis in 22 cases of eye disease, including phlyctenular conjunctivitis and keratitis, sclerotizing keratitis, scleritis, iritis, chorioiditis, interstitial keratitis, chronic conjunctivitis, and papillitis. Positive reactions were obtained in 14 cases and negative reactions in 8. The authors employed P. D. & Co. tablet tuberculin, using 1 per cent. solution. In all cases the eye disease was unilateral, the test being made in the healthy eye. In one case the local reaction was of sufficient severity to call for therapeutic interference, but in none of the cases were there any constitutional symptoms due to the use of the tuberculin.

The authors state that the ophthalmic-reaction does not necessarily indicate a tuberculous etiology of the eye disease, as the tuberculous focus may be in some other part of the body, but they believe that the discovery of Calmette offers a reliable method of diagnosing tuberculous foci in the body.

Clinical histories and results, in some of their cases, are given.

W. R. M.

THE OPHTHALMO-TUBERCULIN REACTION.—BRAWLEY, FRANK M., Chicago (*Ophthalmic Record*, April, 1908). The author concludes, from a study of the reported cases, it would seem that much work is yet to be done before the ophthalmic-tuberculin reaction and its relation to general tuberculosis is fully determined. Exhaustive eye tests with suspensions of various percentage strengths of tuberculin, controlled by skin tests, tuberculin injections and the opsonic index for tubercle bacilli, must be made before we can decide upon the exact value of the procedure and its possibilities of harm to such a delicate organ as the eye, especially in the presence of the various ocular diseases. Second eye tests should be made in the opposite eye where possible, or in the same eye at long intervals, as the experience of the majority of

observers seems to show that the test has a cumulative effect, rendering the eye more sensitive or possibly causes mechanical irritation if used too often in increasing dosage.

The effect of the ophthalmo-tuberculin reaction in apparently normal individuals also requires exhaustive study controlled by thorough, painstaking general examinations. M. B.

DISADVANTAGES AND DANGERS OF THE CONJUNCTIVAL-TUBERCULIN REACTION.—COLLIN, DR. (*Medizinische Blätter*, Feb. 15, 1908). The reaction of tuberculin on the conjunctiva, as it is employed at the present time, has the following disadvantages and dangers: Children and very sensitive adults, compress forcibly the eyelids, after a drop of tuberculin is instilled, expressing thereby a good deal of the fluid, thus preventing its absorption. The amount absorbed cannot be properly estimated. The author advises an instillation of a 3 per cent. cocain solution for from five to ten minutes, before the instillation of the tuberculin.

Tuberculin is contraindicated in cases of trachomatous, follicular, phlyctenular and catarrhal conjunctivitis, not only because the specific reaction is obscured in these affections, but also because the procedure may endanger the eye which had already been affected.

Instillation of tuberculin into the conjunctiva is not without danger to the eye, because the inflammation which follows the procedure does not disappear very readily, and frequently produces marginal ulcers of the cornea, which may lead to perforation. In one case a vaccine tuberculosis of the conjunctiva was produced. J. G.

WARNING AGAINST THE INDISCRIMINATE USE OF THE OPHTHALMO-REACTION (CALMETTE) IN THE DIAGNOSIS OF TUBERCLE.—RAMSAY, A. MAITLAND, Glasgow, Scotland (*The Lancet*, March 7, 1908). The writer reports an instance of serious impairment of vision following the use of the ophthalmo-reaction for the purpose of diagnosing tubercle. The patient, a girl of 12, was suffering from superficial vascular ulceration of the right cornea. There was a history of a similar attack in the left eye two years before and, though careful examination revealed no sign of tubercle in the lungs or abdomen, both cervical and submaxillary glands were much enlarged. One drop of 1 per cent. solution of tuberculin was instilled into the left eye, which was at that time perfectly free from inflammation, though there was a faint nebula on the cornea, the result of a previous attack of ulceration. Within 24 hours there was violent muco-purulent

reaction, the discharge being very abundant and accompanied by marked swelling of the lids and thickening of the palpebral conjunctiva. The inflammation could not be influenced by treatment and progressed until the cornea quickly became vascular and abraded over the central area. Ten days after the instillation, 0.25 cubic cm. of a 1:1000 solution of Koch's old tuberculin was injected subcutaneously. This was followed by a rise of temperature and resulted in great improvement in the right eye, though the left remained unchanged. Subsequently the old tuberculin was injected twice, the first time to the amount of 0.25 cubic cm., and the second time to the amount of 0.5 cubic cm.; seven weeks after admission the right eye was almost recovered, while in the left the discharge had begun to lessen. Subsequently the improvement in the latter was steady, but there remained, as a result of the Calmette instillation, a considerable opacity of the center of the cornea, and in consequence the vision was seriously impaired.

C. H. M.

CONTRAINDICATIONS TO CONJUNCTIVAL REACTION IN OPHTHALMOLOGY.—WOLFF-EISNER, A., Berlin (*Deutsche Medizinische Wochenschrift*, 1908, No. 10, p. 444). The recent opposition to this method is attributed to the employment of too concentrated solutions. The French preparations of tuberculin and those of Hoechst are only about 1 per cent. solutions. While conjunctival affections admit of the application, tuberculous eye affections, especially of the uvea, give a contraindication. The eruption of phlyctenæ in scrofulous patients has been observed after the conjunctival and cutaneous tests. If ocular tuberculosis is suspected, one ought to commence with solutions of 1:100,000, then 1:10,000 and, at the third instillation, 1:1000 ought to be used.

C. Z.

A WARNING AGAINST OPHTHALMO-REACTION.—STUELP, O., Mühlheim a. Ruhr (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, 1, 1908, p. 292), observed in 9 out of 14 cases of eye-patients with tuberculosis, or suspicious of tuberculosis, after instillations of tuberculin, severe inflammatory symptoms, lasting up to seven weeks, on eyes which formerly had been inflamed but were without irritation at the time of instillation, and on eyes which never had been diseased, if the other eyes were or had been affected. The symptoms consisted in formations of follicles in the palpebral conjunctiva and nodules in the ocular conjunctiva of inflammatory, respectively phlyctenular or tubercular structures. In these efflorescences no tubercle bacilli were found, and

inoculations of guinea pigs with them were negative. Stenip confirms the diagnostic uncertainty of ophthalmo-reaction and urgently warns against it in ophthalmology. C. Z.

INJURIES OF THE EYE PRODUCED BY THE OPHTHALMO-REACTION.—ADAM, C. (*Wiener Klinische Rundschau*, March 1, 1908). Tuberculin instilled into the conjunctival sac may produce toxic effects on the eye itself. Diseased eyes, particularly in scrofulous children, are especially apt to become affected by the instillation of tuberculin.

The contraindications may be said to be: (1) Affections of the eye in every form and stage, even after they had been healed up; (2) young children; (3) a previous ophthalmo-reaction, and (4) the intention of employing tuberculin in subcutaneous injections soon after the ophthalmo-reaction. G.

A PROLONGED CONJUNCTIVITIS FOLLOWING CALMETTE'S OPHTHALMO-REACTION.—MACKAY, MALCOLM, Quebec, Can. (*Boston Med. and Surg. Jour.*, March 12, 1908). The patient who was the subject of this observation was a young woman suffering from rheumatism and pulmonary tuberculosis. One drop of Calmette's 1 per cent. solution of tuberculin was placed in the right eye. The reaction appeared promptly and was very decided; photophobia, lacrimation and gumming of the eyelids being exceedingly troublesome. The redness of the conjunctiva was still present and the palpebral fissure kept partly closed five weeks afterward, when there was a severe recrudescence of the trouble, the bulbar and palpebral conjunctiva both being involved with well marked chemosis and gumming of the lids. Ten weeks after the instillation there was still some redness and photophobia. The patient had never had any ocular trouble. C. H. M.

INTERSTITIAL KERATITIS AFTER THE USE OF CALMETTE'S OPHTHALMO-REACTION.—KNAPP, ARNOLD, New York (*Arch. Ophth.*, March, 1908, xxxvii, 171), reports a case of tuberculous keratitis appearing in a previously healthy eye after the instillation of one drop of a 1 per cent. tuberculin solution. The patient had a scrofulous superficial keratitis in the right eye and a drop of tuberculin solution was instilled in the left eye. This was followed by severe local and general manifestations, and was followed ten days later by an infiltration in the superficial layers of the corneal stroma. Knapp concludes that the ophthalmo-reaction cannot be regarded as harmless. W. R. M.

A CONTRIBUTION TO THE TREATMENT OF TIC DOULOUREAU OF THE FACE BY THE ELECTROLYTIC INTRODUCTION OF THE ION OF SALICYLIC ACID.—DESPIATS (*La Clinique Ophtalmologique*, Dec. 25, 1907). The author having had lately to treat three patients with old and rebellious tic douloureux enabled him to try the electrolytic introduction of the ion of salicylic acid as recommended by Ledue, who published reports last year in the *Archives d'Electricite Medicale*. Despiats states that he believes it is of interest to report his three cases and compare the results with those obtained by the application of the continuous current only, according to the method of Bergonie or Zimmern.

Despiats' first case was in an unmarried woman of 38 seen Jan. 9, 1907. General health had been good; at 28 years of age there was a series of crises in a branch of the inferior trigeminal, which was at the time thought to be due to dental caries; extraction of teeth produced no relief. For six years the neuralgia had been localized in the inferior trigeminal, but there were periods of absence of pain during four months. During the painful period, which often began towards the end of Summer to cease by the middle of Spring, patient suffered continually along the course of the inferior maxillary nerve, a painful deafness which varied with the changes of temperature and from mastication and other causes. The crises, which last from half a minute to two minutes, and which at first were not frequent (two or three a day), but increased in number and violence until fifty attacks were had in twenty-four hours, accompanied by facial contractions. The patient had had thirty attacks the afternoon she consulted Despiats. The woman spoke with difficulty, fearing to open the mouth. A number of various kinds of treatments had been had without avail. The painful point was found at the level of the emergence of the nerve. Despiats gave a seance of half an hour with a current of 25 ma., the negative pole on the face holding a compress of cotton saturated with a solution of salicylate of soda. Jan. 1, patient relieved; still some crises, but they are more bearable; no facial contractions. Jan. 14 patient stated she did not suffer; spoke distinctly; no pain on pressure. Seance of one hour with 20 ma. Feb. 2, the seventh and last seance. No return of the trouble since. Despiats gives the details of two other cases similarly and successfully treated. B. E. F.

LUPUS OF THE CONJUNCTIVA AND CORNEA CURED BY RADIOTHERAPY.—AUBINEAU and CHUITON (*La Clinique Ophtalmologique*, Oct. 25, 1907). Lupus of the conjunctiva is a very rare

affection. The treatment most frequently given consists in the application of the cautery, applied not as a destructive but as an irritant; this treatment, however, does not often prevent involvement of the cornea by the disease, it being subordinate to the dietetic, which is the important one. In 1903, Sydney Stephenson (*British Medical Journal*, June 6, 1903) published the first case of conjunctival tuberculosis treated by radiotherapy; cure resulted after thirteen sances, leaving no apparent cicatrix. Villard (*Annales d'Oculistique*, T. cxxxiv, p. 87, 1903) reported that radiotherapy should be employed with the utmost care. Birsch-Hirschfeld (*Graefe's Arch. f. Ophth.*, T. lix) reported 3 cases in which x-rays were employed, producing macular lesions and vacuolar degenerations of the ganglionic cells in the rabbit. Lapersonne (*Presse Med.*, p. 44, 1905) refused to treat by the x-rays malignant tumors of the corneal limbus because there appeared to him no means of protecting the eye.

Since the case published by Stephenson, in 1903, there have appeared in the literature reports of other efforts with radiotherapy in conjunctival tuberculosis. In 1906 Lundsgaard (*Klinische Monatsblactter Augenheilkunde*, vol. xlv, 1906) had recourse to phototherapy and he has obtained by it complete cures. No mention of radiotherapy is made in the chapter on tuberculosis of the conjunctiva in "l'Encyclopedie Francaise" (T. V., 1906). The case of Aubineau and Chuiton was in a girl of 15 years: antecedents good; lupus appeared in her nose in 1904; left eye became red with failing vision. On everting the lower lid, there was discovered below the cornea a surface 1 cm. in length, a yellowish red growth, which reached the inferior cul-de-sac; the cornea was involved as far as opposite the lower portion of the pupil, forming a sort of pannus. There were small conjunctival ulcerations, separated by a budding, uneven, ragged tissue. No adenopathy. Vision $2/3$. There could be no question of the diagnosis, which was lupus of the conjunctiva with involvement of the cornea. Slight cauterizations were made and hot water bathings. August 20, 1905, there was an improvement, with apparently a tendency to cicatrization, but this did not continue. From October 20 to March 15, 1905, five sances of radio-therapy were had, and the improvement was clearly seen. V. $1/x$. The x-ray treatment was continued until December, 1906. On April 6, 1907, upon a superficial examination of the eye, it was impossible to discover that the eye had been diseased. V. $1/v$.

B. E. F.

A BRIEF NOTE CONCERNING THE SUBCONJUNCTIVAL INJECTION OF INDIA INK IN THE EYES OF ALBINOS.—GALTIER (*Annales d'Oculistique*, February, 1908). Komoto, of Japan, claims to have made decided improvement in the vision of albinos by the subconjunctival injection of India ink. Galtier found that the operation was followed by no unpleasant results, and that it gave a bluish white tint to the sclerotic similar to that seen in eyes in which the chorioidal color appears through a thin and translucent sclerotic, and not disfiguring. He proposes, in addition to the coloration of the sclerotic by India ink, to tattoo a peripheral zone of the cornea three or four mm. in width.

(This has been done by others and its effect has been found disappointing, as the impairment of vision in albinos is due, in great part, to the indistinctness of the retinal image in a fundus without pigment.)

G. C. H.

THE TREATMENT OF PANNUS FOLLOWING TRACHOMA BY INOCULATING THE EYE WITH GONORRHEAL PUS.—GOLDZIEHER, VILMOS, Budapest (*The Med. Press*, Feb. 26, 1908). The writer comments on the unsatisfactory results usually obtained in the treatment of pannus crassus. He gives the history of the employment of jequirity and of gonorrheal secretion for this purpose. He narrates the history of one case of this sort, in which the results were surprisingly good, and in conclusion states: "From this case and two others previously treated on similar lines, I can draw the conclusion that the long-discontinued Jaeger inoculation of blennorrhea can be applied as an ultimum refugium. It is by no means more dangerous than a jequirity-caused ophthalmia. The conclusive indication for its application is the presence of a pannus crassus. It is worthy of special mention that after the disappearance of the inoculated blennorrhea not only has the cornea cleared up but—in opposition to the results arrived at with jequiritol—the conjunctival tract has also regained its soundness.

C. H. M.

EXPERIMENTAL INVESTIGATIONS ON THE EFFECT OF HOT AIR ON THE EYE COMPARED WITH OTHER APPLICATIONS OF HEAT.—SATTLER, C. H. (From the eye clinic of Prof. C. Hess in the University of Würzburg. *Archiv. fuer. Augenheilkunde*, lix, p. 358), determined on rabbits the quantity of antibodies in the aqueous after application of hot air, to decide whether hot air causes a more rapid and greater development of antibodies in the aqueous than other forms of heat. Heat has a slight, but distinct, influence on the percentage of agglutinins and hemolysins

in the aqueous, but no difference was observed in the various kinds of its application. If a free supply of antibodies is needed, we have more effectual means in subconjunctival injections of salt solutions or in puncture of the anterior chamber. In the application of hot air other influences, perhaps its desiccating action on the eye, are not excluded.

Sattler also ascertained experimentally the titre of the aqueous in inflammatory conditions and found that it depends, e. g., on the extent of an ulcer of the cornea, its progressive or regressive tendencies and the amount of irritation. The experiments are recorded in tabular form.

C. Z.

MEDICOLEGAL.

A COMPARISON BETWEEN HYSTERICAL AND SIMULATED BLINDNESS.—HANSELL, HOWARD F., Philadelphia (*Ann. Ophthalm.*, October, 1907). A diagnosis of hysterical blindness may be made when accompanied by certain hysterical stigmata, such as ciliary spasm or paresis; amblyopia due to anesthesia of the retina, corresponding in kind to the anesthesia of the skin; contraction of the visual field; relatively greater for white than for colors, and reversal of the fields for blue and red; the tubular field, blepharospasm, monocular diplopia, anesthesia of the conjunctiva and ring scotoma. Simulated blindness is usually not difficult and is to be detected by testing the pupillary reaction, the stereoscopic tests, the use of red and green letters, etc. These patients always have some very good reason for malingering. Several cases are reported in illustration.

M. B.

MISCELLANEOUS.

THE EYE AND THE PELVIS.—FRANKLIN, C. P., Philadelphia (*Ophthalmic Record*, January, 1908). In a very trite and breezy article the author shows the relation between the eyes and the organs of generation.

M. B.

SOME REMARKS ON EYE STRAIN.—THOMPSON, J. L., Indianapolis (*Indiana Med. Jour.*, xxvi, No. 3), finds that there are factors connected with headache, migraine, and other eye strain neuroses which persist after careful correction of refraction error and muscular anomalies, and cannot be corrected by any treatment of the eye alone. Migraine may be brought about, in certain susceptible individuals, of whom the writer is one, by disturbances of digestion, overeating, drinking large amounts of an iced beverage, smoking strong cigars while fasting, or by over-

stimulation of the eye by exposure to bright light. Many young persons can be cured by attention to these points, but adults are, as a rule, not permanently relieved. P. H. F.

SOME NEUROSES FROM REFRACTIVE ERRORS.—O'MALLEY, AUSTIN, Philadelphia (*American Medicine*, April, 1908). The related origin of the cranial nerves supplying the eye is described, also their connection with branches from the carotid and cavernous plexus of the sympathetic system, and through these a connection with the pneumogastric, some cervical nerves, and the great occipital nerve. These numerous anastomoses show that irritation in one part may have widespread consequences. The chief results of irritation from defects in the refractive apparatus are pointed out, as, e. g., "when there is irritation of the ciliary nerves in hyperopia, the irritation passes back through the lenticular ganglion to the fifth or sensory nerve, and causes pain in the parts of the head supplied by the ophthalmic and superior maxillary divisions of this nerve; it may go to the third, fourth and sixth nerves and set up motor disturbances like nystagmus, hippus, chorea-like winking; it may enter the sympathetic vasomotors and produce chronic congestion of the conjunctival and post-orbital vessels, pass through the sympathetic to the vagus and bring about nervous dyspepsia, and so on." Functional and organic causes of headache are mentioned, ocular irritation being emphasized. Special attention is called to the part imbalance of the ocular muscles may have in producing headache, pseudo-choreic and pseudoepileptic conditions, etc. M. D. S.

THE EVER-SHIFTING EYEBALL. SOME NEW EXPERIMENTS AND SOME NEW CONCLUSIONS.—SPRINGER, J. F. (*Scientific American*, March 28, 1908). The globe of the eye is capable of several possible rotational motions, but the point which does not participate in any of them has been called the "line of rotation." The line drawn from this to an assumed point of interest upon the object of visual attention has been called the "line of regard." The older psychologists assumed that this "line of regard" intersected the retina at a fixed point in the fovea, and that a point of regard could be maintained for a time. Now both these assumptions are denied, also it is said that the center of interest is not a point but an appreciable area. In proof of this is given Professor Dodge's experiment of observing intently for a time a bright object, as a white-hot wedge-shaped piece of metal, which, stimulating certain definite elements of the retina, produces a

somewhat persistent after-image. After this a small ink mark is made upon a piece of cross-section paper, and the attention fixed upon this mark. The after-image is never still relatively to the fixation mark, showing a continual movement of the globe. Subjective effects of the experiment (which the writer mentions) interfering, make it difficult to measure the amount of such movement. The writer describes several experiments suggesting "that all fixation movements—whether large or small—are due to efforts in compensation of bodily movements. With the utmost effort, however, to restrain the body and fixate the eye, it is found by using refined methods of detection that minute fixation movements still occur. It has been found that certain movements tallied with the pulse, others seemed to be due to breathing movements, and so on. The circulation of the blood—to say nothing of respiration—no doubt causes minute movements of the head and neck, and these in turn occasion infinitesimal corrective motions of the globe of the eye. Again, the numerous opposed muscular attachments at various points in the body are, generally speaking, no doubt in a continual oscillation, also requiring incessant compensation." Although these fixation movements may be said to be involuntary, yet a subconscious motive seems to be implied. "Professor Dodge suggests as one of the possible physiological motives that of retinal fatigue." "With objects of regard having the same shape but differing in size, the completeness of relief from fatigue afforded by a slight shifting would be greater the smaller the object. With the larger objects, then, the full movement to secure relief would be larger in amplitude, and would seem to persist for a longer time. By using different-sized similar objects, and measuring amplitude and time of the fixation oscillations, it would seem possible to secure confirmation or refutation." The writer says these experiments are really preliminaries to an elaborate experimental inquiry. M. D. S.

MIRROR WRITING.—BUCHANAN, LESLIE. Glasgow (*Ophthalmoscope*, March, 1908). A boy seven and a half years of age was seen on account of a peculiar tendency to write reversed letters and figures. His vision was poor on account of hyperopic astigmatism. When he began to learn writing he was given a copy and began at the top of the right-hand corner of the page and wrote with his left hand toward the top left corner. The letters were reversed. The tendency was combated by the care of the teachers, and soon the boy was able to write with either hand. Still he had a tendency to reverse his letters, and it was only by

constant watchfulness that he kept from doing it. Specimens of mirror writing submitted to him were read off easily, and he saw nothing peculiar about them. Cases are referred to which have been reported by others, as well as the theories advanced in explanation. It is more frequently seen in left-handed children. There are many well authenticated instances of individuals who have suffered from right hemiplegia (lesion on left side of brain) who have learned to write with left hand and have had a distinct tendency to write mirror-wise. M. B.

THE NEED OF STATE ORGANIZATION OF EYE, EAR, NOSE AND THROAT PRACTITIONERS.—STEVENSON, MARK D. (*The Ohio State Medical Journal*, Feb. 15, 1908). After referring in a general way to the practices of charlatans, the writer discusses the methods of quackery used in treating eye diseases. He gives several reasons why eye, ear, nose and throat practitioners should be active in state organization work. A general practitioner may send his patients to opticians because he thinks the specialists' fee large; he may desire the optician and his friends as patients; he may fear the specialist will prescribe for his patient; he may question the specialist's knowledge of refraction, knowing the short course in eye, ear, nose and throat work taken by some physicians. It should be understood that those who prescribe lenses for defective and diseased eyes, should be able to know when other treatment is necessary, that much harm may be done—e. g., in glaucoma—by failure to detect disease. The fallacy in the parallel which opticians attempt to draw between their efforts for legislation and those made by dentists is shown. The steadily rising standard of medical education is discussed, and the contrast drawn between the well prepared physician who does eye work and the optician. People should be enlightened as to the distinction. The lack of foundation for the titles, "Doctor of Ophthalmology," etc., should be made known. The absurdity of the claims of some of the most popular schools for opticians is shown by quotations from their announcements. Their attacks on the use of cycloplegics are mentioned. While it is no doubt deplorable that some specialists have but a few months' training, yet opticians fail to see the difference in the ability of the former with a previous knowledge and training given by a medical course, and their own position, where no previous training is required. The optician's subtle methods of advertising are mentioned. They have well organized state societies in forty states, besides their national, local and interstate societies. In twelve states the practice of "optometry" is li-

censed. The need of some of our leading medical schools making provision for the student to elect a course in optics and all branches of ophthalmology in addition to his regular work in medicine and surgery is emphasized. The writer, who formerly believed all optical legislation pernicious, now believes that in spite of many objections, a good optical law might be advisable. He thinks that a committee might be appointed by the eye, ear, nose and throat section of the state medical association to co-operate with a committee of opticians, who together might formulate a law by which conditions could be improved. M. D. S.

THE INDUCTION OF PREMATURE LABOR.—POOLEY, THOMAS R., New York (*Am. Jour. of Surg.*, March, 1908). The writer urges that in all cases of pregnancy, it is not only desirable to examine the urine from time to time, but also to examine the eyes with the ophthalmoscope, even in a routine manner, since, as is well known to oculists, a large percentage of the cases having lesions of the optic nerve and retina, either have none or make no complaint of loss of vision; but such changes may lead after a long interval, through the secondary or atrophic changes, to complete blindness. He advises that where neuroretinitis with grave organic lesion of the optic nerve and progressive loss of vision is present, in the later months of pregnancy, and the child, if not dead from the effects of kidney disease, may be viable, it is not only justified, but urgently demanded that premature labor be resorted to. If the danger of delay is such that to wait until this time would be to doom the patient to blindness, the operation should be performed even in the earlier months.

In addition, he advises that in these instances in which, in one pregnancy affections of the vision have occurred which have remained permanent, abortion or premature labor in the following pregnancies which occur, may be rendered necessary. He considers that the prognosis as to the recovery of vision is better in cases in which chronic nephritis does not already exist, and that the induction of premature labor or abortion both morally and legally, is justified in order to save vision as well as life, and finally that women having once suffered loss or impairment of vision during pregnancy, should have the danger of again becoming so, and the relation of cause and effect, fully explained to both themselves and their husbands. C. H. M.

SOME POINTS CONCERNING THE EYES OF THE JAPANESE.—STEINER, L. (*Zeitschr. f. Morphol. und Anthropol.*, Band x. Hft. 3). examined natives of Soerabaya and the adjoining country (East

Java). In general the eyes lay deep, appear smaller than of the Europeans. The ocular split had an average length of 27, 28 mm. on the right side and 27 mm. on the left in 18 full grown men; for the right eye in women it was 26, 75 mm. and for the left eye 26, 4 mm. (from an average of 11 full grown women). The Javanese have therefore a smaller rima palpebrarum than the Europeans. The horizontal corneal diameter averaged for men in both eyes 11, 46 mm.; for women in the right eye 11, 47 mm. and 11, 45 mm. in the left one. The vertical diameter for men and women in both eyes averaged 11, 2 mm.

The white of the eye shows in general a shade of brown. Irregular brown-black patches are often seen in the conjunctiva bulbi, in the part exposed to the light, while such are very seldom seen in Europeans. They form often a small arc around the cornea. Often few and small, in other cases, with people who lived much outdoors, so numerous and large that the white of the eye is covered for the greatest part, which produces a peculiar expression. Rarely those patches are found in places protected from the light under ordinary circumstances. If other parts of the conjunctiva become exposed to the light through pathological conditions, then also here brown patches appear, f. i. the everted conjunctiva in ectropium of the under lid showed a marked brown color and was strewn with brown-black patches, while the rest of the conjunctiva had the regular red color. The border of the brown coloring corresponded exactly with the inner margin of the ectropium. The light produces, therefore, this brown coloring. Steiner never observed this coloring in Europeans with ectropium. Trachoma produces brown-black patches in the conjunctiva of the Javanese, not exposed to the light. Microscopically the conjunctiva shows pigment cells and grains, which are invisible macroscopically. In the skin often pigmented naevi are found, which not infrequently stray into the conjunctiva. They are found in all parts of the conjunctiva as small, sharply defined, ink-black, round patches, now and then astride on the lid margin, so that the one-half belongs to the skin, the other to the conjunctiva.

The iris is very dark black-brown. The fundus is very dark red-brown.

E. E. B.

MUSCLES.

OCULAR PARALYSES AND THEIR DIAGNOSIS; A CLINICAL METHOD FOR STUDENTS.—ALGER, ELLICE M., New York (*Ophthalmic Record*, March, 1908). The question of the kind of diplopia is disregarded. For the obliques, determine if there is a tilting of

a pencil held vertically before the eyes, then determine which eye sees the tilted pencil; now tilt the pencil until it seems vertical. Its direction must correspond to the position of what was the vertical meridian of the eye, before the paralysis. If this meridian is now tipped outward, it is due to relaxation of the superior oblique; if inward of the inferior oblique. For the lateral muscles, the important point is that a lateral diplopia, increasing as the eyes are turned to the right, indicates a paralysis of the right hand muscle of the eye having the right hand image. Similarly a lateral diplopia increasing as eyes are turned to the left indicates a paralysis of the left hand muscle of the eye having the left hand image. Vertical diplopia increasing markedly as eyes are turned up is due to paralysis of the superior muscle of the eye having the superior image, which can be identified by a red glass. A vertical diplopia increasing eye down is due to a paralysis of the inferior muscle of the eye having the inferior image. M. B.

OCULAR ROTATIONS IN PARESIS.—VALK, FRANCIS, NEW YORK (*Jour. A. M. A.*, April 11, 1908), insists that all tests for a parietic muscle be made with the look in complete infinity and with full acuity of vision. We must have a standard of the field of vision for comparison of any deficiency of rotation. The straight muscles are capable of moving the eyes in any part of the field of vision, and from one part to another, and in no part will the recti fail to act according to their usual function. The obliques take no part in the rotation of the eyes, and do not elevate or depress the visual line. In the diagnosis of paresis we may exclude the condition of crossed or homonymous images and also the tipping, except in a pathological condition of the obliques. The individual muscles of the eyes are not "endowed with two distinct functions, as they have but one nerve supply," except possibly in the action of convergence and inward rotation. Valk's conclusions are so evidently drawn from faulty and insufficient observation, and so diametrically opposed to our elementary knowledge of the anatomical, physiological, and clinical facts in regard to the functions of the external muscles of the eye, that any practical tests based upon his theories must be quite futile.

P. H. F.

MOVEMENTS OF THE HEAD AND NYSTAGMUS.—HANCOCK (*Allgemeine Wiener Medizinische Zeitung*, February 18, 1908). The author distinguishes two varieties of the disease, 1. Spasmus nutans, and 2, the congenital form, which lasts through the entire life, and frequently affects several members of the same family. He examined ten cases of the first variety, and ascribes them to

be due to rickets, dentition, trauma, neuropathic diathesis, gastrointestinal catarrh, living in dark rooms and affection of the semicircular canals. The congenital form, of which the author has seen five cases, are distinguished from the former by the fact that motion of the head begins right after birth, and continues during the entire life of the individual; it is usually combined with amblyopia; and lateral nystagmus is always accompanied with rotary movements of the head. In spasmus nutans, the movements begin usually from one to six months after birth, and after a certain period have a tendency to disappear. J. G.

ON THE ETIOLOGY OF PARALYSIS, ESPECIALLY THE ISOLATED PARALYSIS OF THE 6TH NERVE.—KOEHLNER, Assistant (From the clinic of Prof. J. von Michel in the University of Berlin. *Deutsche Medizinische Wochenschrift*, 1908, No. 3, p. 112), reports on 250 cases of paralysis of the 6th nerve, with brief clinical histories, due to intoxications; alcohol, lead, drugs (anthelmintics, but it could not be ascertained which), stovain, tropacocain, novocain in lumbar anesthesia; infections; malaria, influenza, erysipelas of the face; diseases of the kidneys, albuminuria, diabetes; disturbances of circulation, as arteriosclerosis leading to hemorrhages, miliary aneurisms and foci of softening in the nucleus, sclerotic changes of the internal carotid, which crosses the abducens twice; diseases of the central nervous system; lucas of the brain, tabes, multiple sclerosis, polioencephalitis, chronic progressive ophthalmoplegia, cerebral tumors, myasthenia gravis pseudoparalytica, hysteria, hemicrania; vasomotor disturbances; traumatic, octogenous (the exact cause in the 4 cases reported could not be ascertained), congenital palsies, and paralysis without ascertainable cause.

The isolated paralysis of the abducens was most frequently observed if toxic substances invaded the organism, either chemicals or from infectious diseases, or in disturbances of circulation. Both lead to changes of the vascular walls, with subsequent motor derangements of the ocular muscles, chiefly the abducens, owing to its long course through the cavernous sinus. The isolated palsy is either nuclear or basal, especially in injuries of the apex of the pyramid of the petrous bone. It must also be remembered that the 6th nerve crosses the posterior inferior cerebellar, the auditive, and internal carotid arteries. If damaged at its exit from the brain, it generally is associated with focal symptoms of other nerves. Each isolated palsy of the abducens calls for repeated careful examinations of the whole nervous system. Although the prognosis of infectious and toxic palsies is on the whole favorable, it may be the precursor of a commencing

nervous trouble, e. g., in tabes paralysis of the abducens with and without iridoplegia may be the only affection of a cranial nerve. Koellner's cases show that in a great number of isolated palsies of the abducens other, even slight, disturbances of the remaining nerves may be of diagnostic value with regard to etiology. The frequency of the various etiological factors is illustrated by the following table:

	Isolated paralysis of the abducens.	Isolated paralysis of the abducens with simul- taneous affections of the chorioid and retina.	Paralysis of the abducens combined with other ocular palsies.
in chronic alcoholism	3	—	3
" intoxication by lead	2	—	—
" intoxication by drugs	1	—	—
" Malaria	1	—	—
" Influenza resp. acute neuritis.	1	—	—
" Erysipelas	1	—	—
" Nephritis	5	1	1
" Diabetes	1	—	—
" Diseases of the system of circula- tion	4	—	1
" Chronic meningitis	2	—	6
" Acquired lues	14	1	25
" Hereditary lues	—	2	—
" Tabes	11	—	59
" Paralytic dementia	—	—	1
" Multiple sclerosis	2	—	5
" Poliomyelitis	—	—	2
" Chronic progressive ophthalmop- legia	—	—	1
" Myasthenia gravis	—	—	6
" Hysteria	3	—	—
" Hemiparesis	1	—	—
" Vasomotor disturbances	4	—	—
" Traumatism	6	—	7
" Lumbar anesthesia	1	—	2
" Diseases of the ear	2	—	13
" Tumors of the brain	—	—	—
Without definite diagnosis	32	—	8
	103	4	143
			C. Z.

SOME POINTS IN THE TREATMENT OF STRABISMUS.—BETTRE-
MIEUX (*La Clinique Ophthalmologique*, Oct. 10, 1907). The
author considers it surprising as to how great the differences of
opinion that exist and which are to be found in ophthalmic litera-
ture of late years as to the essential points of treatment in strabis-
mus. This is especially true as to the best age for the patient's
operation. Priestly Smith, at the Congress at Utrecht, stated that
with a supposed case presented at 12 years with a permanent
strabismus, with a doubtful power of fixation of the deviating
eye, for a few months optical treatment will ameliorate the power
of fixation and then it will remain stationary. Priestly Smith
does not believe it necessary to wait three or four years or until
5 years of age is reached by the patient, as recommended by
many English ophthalmologists. Javal, in his manual on strabis-
mus, subordinates the time of operation to the ability of the
patient, if a child, until it arrives at an age when the stereo-
scopic exercises can be satisfactorily executed; at the same time
Javal states he has never regretted intervening too soon; and in
1898 he affirmed his preference for the operation in young sub-
jects—that the most important object is to establish binocular
vision, which later becomes more difficult of accomplishment by
delay. Bettremieux believes that if after six months' or a year's
gymnastic and optical treatment nothing has been accomplished,
surgical intervention should then come. B. E. F.

CONTRACTION OF THE LEVATORS OF THE EYELIDS WITH
PARALYSIS OF ELEVATION AND CONVERGENCE OF THE EYES;
ELONGATION OF THE LEVATORS.—CHAILLOUS (*Annales d'Ocul-
istique*, October, 1907). A woman, 62 years of age, had had
trouble with her eyes for two or three months without known
cause. She could close her eyes only incompletely and by strong
voluntary effort. When she looked down, the upper lid remained
contracted and the sclerotic was extensively exposed. The eyes
remained wide open during sleep. The upper eyelids were strong-
ly retracted and concealed beneath the swollen skin of the orbito-
palpebral region. The movements of elevation and of convergence
of the eyes were lost, but the internal recti acted in lateral move-
ments. The eyes were healthy and vision was nearly normal with
correction of high hypermetropia.

The levators were elongated by means of a tongue-shaped flap,
with a satisfactory result. G. C. H.

MYOPIA.

ON THE CONNECTION BETWEEN NEAR WORK AND MYOPIA.—
THORNER, WALTER, Berlin (*Klinische Monatsblätter fuer Augenheilkunde*, xlvii, 1, p. 10, January, 1908). It is a generally acknowledged fact that near work is a necessary factor in producing myopia in eyes of a certain predisposition, which is probably due to an insufficient firmness of the posterior portions of the sclera. But opinions widely differ with regard to the nature of the deleterious moment in near work. Thorner discusses the four chief theories, viz., of accommodation, convergence, trochlear muscles, traction on the optic nerve, each of which may have a certain influence, calls attention to the peculiar kind of ocular movements in near work, especially in reading, and distinguishes between continuous and discontinuous movements. He studied these by a special method with his ophthalmoscope, through which the excursions of the slight movements of the eyes appeared under a diameter of 16 and could be much more easily observed. He shows that in reading only discontinuous movements are carried out, and that these are much more able to exert a traction on the sclera than continuous movements. The discontinuousness of ocular movements in reading is owing to the fact that a large number of objects, lying close to each other, must be exactly perceived by the eye, and, since these objects are not in motion, the eye must form their single images successively upon the fovea. Thorner demonstrated by his method that an experienced reader makes seven such movements in a second. Two syllables, i. e., six letters, are read in one stop of the eye, which amounts to 25,000 sudden stops of the eyeball in one hour. If reading is continued for hours, one can easily conceive that a traction is exerted on the sclera by the simple mechanical inertia. Since the rate of these jerks is equal in the same individual, each jerk will be the larger, the greater the visual angle will be under which a single syllable appears. At half the distance it will be twice as large, and the mechanical moment of traction four times as large, being proportional to the square of velocity. This occurs when, from some reason, e. g., poor illumination, the book has to be approached to the eye. Thus in myopes in which the posterior pole is farther from the point of rotation on account of the elongated axis, the excursions are greater than in emmetropes. This is not prevented by monocular fixation, since Thorner proved experimentally that the non-fixating eye performs the same motions as the fixating eye.

Thorner concludes that the prevention of myopia would be materially simplified, if his assumption be confirmed, that reading has a much greater influence on the development of myopia than all other kinds of near work. C. Z.

LATE RESULTS OF THE MYOPIA OPERATION.—HUBER, FRITZ (Doctorate thesis), analyzes the late results of 90 cases with 100 eyes, done by Professor Haab. Until his thesis Haab had performed 156 myopia operations. Fifty-six of the operated were women, 34 men. Ten patients were operated on both eyes. The plurality was of the age between 11 and 30. The large majority had a vision of .01 to 0.5, which could only be reached with strong concave lenses, and which could not be worn on account of complaints. Ninety-one eyes after the operation, as against 47 eyes before, showed a vision of 0.25 to 1.0, while only 9 eyes after the operation, as against 53 eyes before, had a vision of 0.01 to 0.25. After the operation emmetropia was found in 17 eyes, hypermetropia in 71 and myopia in 12 eyes. Seventy-five operated eyes of 66 patients could later be re-examined; the shortest time after the discharge being two years (9 eyes). More severe sequences of the myopia gravior were seen in 34 eyes, viz., 11 cases of disease of the macula, 9 cases of opacities of the corpus vitreum, 9 cases of retinal hemorrhages (two of which after trauma), 5 cases of solutio retinæ (two of which traumatic). One must take into account that mostly the stronger myopic eye, and often also the one with the poorest vision, was selected for operation. Besides, twice the vision was lost through optic nerve atrophy, once after glaucoma and once after infection. In 37 eyes the myopia increased after the operation to an average of 1 to 3 diopters. The last test showed the vision in 33, or 44 per cent., to be 0.5 to 0.75, then follow 19 eyes, or 25.33 per cent., with visus 0.25 to 0.5. Six eyes, or 8 per cent., were amaurotic.

The following conclusion has been deduced from these observations, that phakolysis cannot be recommended as a sure palliativum for the constantly progressing myopia and its severe consequences. Every patient must therefore be warned that the operation involves a certain risk, and told that experience has taught that the operated eyes must be taken care of after the operation just as well as before to prevent complications as much as possible. It has not been shown that these operated eyes have a greater resistance power and can do more work. Such eyes keep the same vulnerability as the myopic ones. E. E. B.

ABOUT THE LATE RESULTS OF SEVENTY-FIVE EYES OPERATED FOR MYOPIA. GRAYTOR—SIDLER-HUGGENTIN. (*Korrespondenzblatt fuer Schweizer Aerzte*, Nov. 11, 1906), the insulator of Haller's dissertation, returns to the 75 operated eyes. Professor Haidt had these operated after Fukala's method: discission with following punctions. The vision of these 75 eyes showed, compared with the forelast taken, that it remained the same in 2 eyes, ameliorated in 57 eyes and diminished in 16 eyes. Except the amaurotic eyes, the decrease of vision was caused in 2 eyes by fresh diseases of the macula, in two eyes already existing macular changes increased, in 3 eyes central retinal hemorrhages, in 1 eye peripheral retinal solutio, in 1 eye still present thick posterior capsule, in 1 eye unknown cause. The refraction had become changed: 23 eyes became emmetropic, 12 eyes became myopic, 34 eyes became hypermetropic (and 6 eyes became amaurotic). In the run of years the emmetropic eyes have increased considerably, the hypermetropic decreased markedly and the myopic have changed the least.

From reported statistics of different writers it appears that about 3 retinal solutions happen in 100 myopic eyes. Among the 75 re-examined cases 5 retinal solutions were found, 2 of which happened after a trauma, which makes 3 that could be caused eventually by the phakolysis. As these 3 all happened a long time after the operation, it would be decidedly unfair to suppose these 3 non-traumatic solutions due to the phakolysis, although a certain causal connection cannot be disproved, as in the other 57 eyes non-operated no ablatio appeared. It should be noticed that this number of 57 is much too small to draw conclusions. It is impossible to decide which percentage is due to the operation and which to the myopia. Till the end of 1902 the result of 1,749 operated eyes were reported, which showed 55—3.14 per cent. of retinal ablations. The phakolysis is therefore not able to prevent retinal solutio; on the contrary, it seems perhaps in a small percentage to favor it.

It is the same with the other myopic complications: diseases of the macula, opacities of the vitreous body and retinal hemorrhages. About twice as many diseases of the macula and nearly four times more retinal hemorrhages appeared in the operated eyes than in the non-operated. It will be more or less right to account for 1 per cent. to 1.5 per cent. loss of vision through central retinal and chorioidal diseases due to the operation. From the statistics we see that 1.166 per cent. through infection and 0.69 per cent. through glaucoma become more or less blind. The

total loss from phakolysis will therefore be rather more than 5 per cent.

Only those who cannot profess their trade under the correction can be recommended the phakolysis. As soon as possible full-correction prevents the best progress and serious complications. No myopes under 22 to 25 diopters are more operated. If lenses are early prescribed and slowly increased 8 to 10 diopters will be tolerated, a grabfront for the distance can be added. Next to strong myopia in both eyes, those cases where one eye has no, or only a small, and the other eye a high degree of myopia, are suitable for operation. By preference only one eye should be operated, as in some cases of destructive macular disease and retinal solutio happened justly in the operated eye, so that the patient was happy with the non-operated eye. No eye should be operated when a retinal solutio or other serious fundus disease exists in the other eye, as we know that mostly both eyes are predisposed to the same complication.

After finishing this report three new retinal solutions came under treatment, which make six retinal ablations causally connected with the phakolysis; the loss is then not 1 per cent., but 5 per cent. Longer waiting, therefore, made the operative result still worse, while in the same time no ablatio appeared in the 57 non-operated eyes.

E. E. B.

OPERATIONS.

PALPEBRAL OR FACIAL AUTOPLASTY BY THE AID OF PEDUNCULATED FLAPS TAKEN FROM THE CERVICAL REGION (PROCEDURE BY SYNDACKER) AND AUTOPLASTY IN TWO PERIODS WITH UTILIZATION OF THE TRANSPLANTED FLAP.—MORAX (*Annales d'Oculistique*, January, 1908). In Syndacker's operation a flap is taken from the skin of the cervical region parallel to the sterno-cleido-mastoid and with its base just below the ear. The free end is sutured in the bared space on the lid and brow, while the ridge between it and the base lies upon the skin of the cheek. After the flap has united this bridge is cut away.

When the loss of substance is too extensive to be replaced in this way, Morax, instead of cutting away the bridge, frees only its base and, after scraping the granulations from its lower surface and freshening its margins, uses it to form an additional flap. Several cases in which this operation was performed are reported.

G. C. H.

OBSERVATIONS ON THE MOTAIS OPERATION FOR PTOSIS. REPORT OF THREE CASES.—SHOEMAKER, WM. T., Philadelphia (*Ann.*

Ophthalm., October, 1907). After describing this operation he recommends suturing the tongue from the superior rectus into the upper edge of the tarsus through a skin wound made down to the tarsus through the upper lid. He believes that this skin wound is not only not objectionable but that it makes it possible to attach the tongue to the tarsus in the proper manner, which cannot be done through a conjunctival wound. He arrives at this conclusion after operating upon three cases after the method of Motais.

M. B.

A PLASTIC OPERATION FOR CENTRAL COLOBOMA OF THE LIDS.—FALCHI, F., Pavia (*La Clinica Oculistica*, February, 1908). 1. Freshening of the lid margin by removal of the epithelium layer to the conjunctiva in the external and internal thirds of the upper lid if the seat of the coloboma and of the entire lid margin of the normal lower lid.

2. Freshening the margins of the coloboma by two incisions, practiced with Graefe's knife, beginning at the lid margin and passing up to unite at the apex of the same.

3. Perpendicular incision through the external commissure of the lid and all the thickness of the colobomatous lid with conjunctiva to the top of the lid.

4. Suture the margins of the internal third of the two lids, then the margins of the coloboma including skin and tarsus, then the lid margin of the external third of the colobomatous lid, so drawn and placed as to occupy the site of the coloboma with the corresponding margin of the lower lid.

5. Incision through all the thickness of the skin of the external commissure prolonged in the temporo-palpebral region, following the direction of the line of the palpebral slit to surpass by 5 mm. the length of the external third of the lid margin which is wanting; then from the external extremity of this incision, another incision passes upward parallel to the freshened line of the external palpebral limit and extends to about 3 mm. from the eyebrow. This circumscribed flap is dissected up and sutured by its internal edge to the external edge of the palpebral middle third and by its lower edge to the corresponding palpebral margin of the lower lid. There is left in the temporal region a triangular freshened space which is covered by skin from the inner surface of the arm. This method also applies to coloboma of the lower lid with the following slight variations: The perpendicular incision through the external commissure is prolonged down through all the thickness of the lid.

d. The external commissure incision is prolonged through the skin thickness in the palpebral-temporal region following the line of the palpebral slit and surpassing by 5 mm. the length of the external palpebral third; then from the end of this, an incision is made directly down parallel to the freshened line of the external palpebral limit to about 2 mm. from the palpebral-malar sulcus.

After the operation irrigate with sublimate 1 to 5,000 and apply iodoform powder and a dressing of sublimate cotton and sterilized gauze dipped in a solution of mercury. The first dressing remains 48 hours; the wound is then dressed daily until healing, which usually is complete in 15 to 23 days. The author reports two cases successfully treated by the above method. R. H. J.

BLEPHAROPLASTY OF A TOTALLY DESTROYED UPPER LID.—ULBRICH, H. (From the eye clinic of the German University at Prag. *Archiv fuer Augenheilkunde*, 58, p. 9). A carcinoma of the upper lid of a man, aged 55, not yielding to treatment with radium and, upon exposure to Roentgen rays, commencing to spread into the depth, was extirpated. The defect of the upper lid reached in the center up to 1/2 cm. from the eyebrow and inward to the retrotarsal fold. After removal of the cilia, the lower lid was sewed into this defect by uniting conjunctiva with conjunctiva and skin with skin. A small opening was left at the nasal corner for drainage. It healed by first intention.

After six weeks the skin over the eye was somewhat stretched but not sufficiently to allow of good closure of the lids after restoration of a palpebral fissure. Therefore a small skin flap from the upper arm was implanted at the place of the future lower lid. After six weeks the lid was incised, 3 mm. above the edge of the transplanted flap, and the skin sewed on the conjunctiva along the edges of the new palpebral fissure. Six weeks later, the palpebral fissure was 20 mm. long; it could be opened 5 mm. and completely closed. C. Z.

ECTROPIUM OPERATION.—BEST, F., Dresden (*Klinische Monatsblätter fuer Augenheilkunde*, xlv, 11, 1907, p. 501). The greatest number of ectropia of any amount occur on the lower lid, thus demonstrating the importance of gravitation in their further development. Therefore the operative treatment must consider this point, either by pulling the lid up or by supporting it from below. This may be effected by forming a wedge-shaped flap from the skin over the zygomatic bone and inserting its apex into the prolongation of the lower cut towards the nose. Through this wedge the skin of the lid will be forced upwards.

Lagleyze's method following this principle is described, and a modification of it by the author, who places the wedge-shaped incisions not into the skin of the lids, as Lagleyze, but into the cheek. Best found his method very valuable in cases in which other procedures (of Wharton Jones, Szymanowsky, Axenfeld, Kuhnt-Mueller) had not been sufficient.

Then the question is discussed whether blepharoplasty in cicatricial ectropium should be done with pedunculated or non-pedunculated flaps or according to Thiersch. Best gives preference to non-pedunculated flaps, and emphasizes the importance of asepsis, careful stopping of bleeding, fastening of the flap by fine sutures, not to touch it within the first two to three weeks, and not, as Kuhnt proposed, to tuck it under the undermined edges of the surroundings, lest the skin be injured from which the flap partly receives its nutrition.

C. Z.

ON THE TECHNIQUE OF EXTIRPATION OF THE LACRIMAL SAC. — KRAUSS, W. (From the eye clinic in the University of Marburg. *Archiv fuer Augenheilkunde*, lix, 4, p. 351). The extirpation of the lacrimal sac may be rendered very difficult by profuse hemorrhage. Krauss studied very carefully the anatomical relations of the bloodvessels at this region and worked out a new method of operating, which avoids as much as possible their separation. After irrigation of the sac with physiological salt solution, $1\frac{1}{2}$ to $3\frac{3}{4}$ c. cm. of a solution of acoin-cocain-suprarenin are injected in front of and behind the sac. An incision, 2.5 cm. long, commencing 4 to 5 mm. above the internal palpebral ligament, at a distance of 7 to 8 mm. from the inner canthus, severs the external skin only. The subcutaneous tissue is bluntly separated and Müller's speculum inserted, and the ligament, capsule of the sac and anterior lacrimal crista laid bare, without bleeding to speak of. The ligament is loosened from the sac with a raspatory and mobilized. If the apex of the sac reaches very far upwards and cannot be sufficiently freed, the ligament is cut in the middle and the sac detached from the periosteum. It is pulled forward and with scissors cut off from the canaliculi, the surrounding tissues, and the naso-lacrimal duct. The ligament is reunited by a suture and the wound by 3 to 4, which may be removed after two or three days. Krauss tested the value of his method in 180 extirpations and does not hesitate to recommend it as the best. The procedure is illustrated on a well executed plate made from photographs taken at the operation on a man, aged 78.

C. Z.

CYCLODIALYSIS AND ITS INFLUENCE ON INCREASED INTRAOCULAR TENSION.—MELLER, J., Vienna (*Gräfe's Arch.*, lxvii, II, 3, February, 1908), gives the operation of Heine in its minutest details. After thorough cocaineization the conjunctiva and capsule of Tenon are dissected up so that a small area of the sclera, about 5 mm. from the corneal limbus, is exposed. An incision is made through the sclera parallel to the margin of the cornea and preferably down and out and not longer than 2 mm. The incision is made with the lance knife, slowly and carefully without pressure, to avoid injury to the uvea. That the sclera has been penetrated can be told by the release of the resistance and the appearance of the uvea in the bottom of the wound and the fact that the slightest movement of the instrument on the ciliary body causes pain. During this procedure the eye is rotated strongly upwards and fixed by forceps. Hemorrhage may be annoying and can be controlled by adrenalin. Should a ciliary vessel be cut it may be seared by the thermocautery. The second step consists in the introduction of an iris spatula into the wound and carrying it forward between the sclera and ciliary body. Difficulty in this maneuver may result from entanglement of the tip of the instrument in incompletely divided fibers of the sclera. The instrument is entered somewhat obliquely and as soon as it has passed through the sclera it is made parallel with the surface of the sclera and pushed on gently until its tip appears in the anterior chamber.

The third step consists in the separation of the ciliary body from the sclera (the formation of the cyclodialysis). This is accomplished by giving to the spatula a side to side movement. The separation extending from the vertical meridian below to the horizontal meridian on the temporal side. The spatula must not be entered further into the anterior chamber than to permit of its tip being always visible. After the undermining is completed the spatula is brought back to its primary position and slowly withdrawn. No resistance is met with in undermining unless: 1. Scleral fibers arrest the point of the spatula. This will take place while the tip is still within 1 mm. of the opening. 2. By a nerve or blood vessel passing from the sclera to the ciliary body. All hemorrhage should have ceased before withdrawing the spatula lest the blood be sucked into the anterior chamber. A certain amount of hemorrhage is apt to follow so free a separation of the ciliary body and an attempt should be made to control it with the finger. After completion of the operation a pressure bandage should be applied for eight hours. 3. Resistance can be felt when the spatula impinges upon the scleral insertion of the fibers of the

ciliary muscle. 1. A resistance to the advance of the spatula through the penetration of its point between the membrane of Descemet and the corneal parenchyma. From this an opacity results which, however, slowly disappears. It is due to a swelling of the parenchyma itself. It appears to be a frequent complication of the operation. A fifth, but unimportant obstruction is the union of the root of the iris to the posterior surface of the cornea. This may lead to the production of an iridodialysis, but it will not have any sequelæ.

Two complications which, however, seldom occur are: Too rapid cutting through the sclerotic when that membrane is pathologically thin, and the incision placed too far from the limbus may cause a prolapse of the vitreous. 2. That the operator instead of keeping to the scleral wound penetrates the uveal tract, so that the spatula comes out behind the iris.

Injury to or luxation of the lens should not be possible. The full effects of the operation are reached gradually in from one to three days.

The effects may be divided into three groups: 1. Permanent unfavorable result. 2. Transient result. 3. No effect whatever.

In Meller's series 40 per cent. fell within the first group. This is in a measure explained by the character of the cases which at first were chosen for operation—absolute glaucomatous eyes. The second group contained 30 per cent. of the cases. In the third group were mostly cases of absolute glaucoma, in one instance, glaucoma secondary to a chorioidal sarcoma. This group contained about 30 per cent. The indications for the operation are primary as well as secondary glaucoma except such cases of secondary glaucoma arising from *seclusio pupillæ*, iris bombé, etc. In adherent leucoma it is very serviceable. In dislocation of the lens the operation is strongly indicated.

It cannot be said that the operation of cyclodialysis will take the place of iridectomy, and that the presence of primary glaucoma calls for the performance of the operation. The real indication for it is the impossibility of performing iridectomy from the presence of very high intraocular tension and absolute glaucoma which has progressed far.

W. Z.

A CASE OF TRANSPLANTATION OF THE CORNEA WITH PRESERVED TRANSPARENCY.—PLANGE, O., Muenster (*Klinische Monatsblätter fuer Augenheilkunde*, 1908, xvi, 1, p. 277). On September 25, 1906, a laborer was brought to Plange, whose right eye, the only good one, was burned by unslaked lime 15 minutes previously. The lower half of the cornea was white like porcelain and com-

pletely opaque, the remainder bluish white. After thorough cleansing the eye was bathed in a 10 per cent. solution of tartrate of ammonium. The necrotic process developing within the following days could not be arrested and led to perforation of the cornea, with prolapse of iris. The upper lid was, by symblepharon, adherent to the whole cornea, the patient became totally blind.

His left eye was amaurotic from phthisis subsequent to an injury in early youth, but its cornea was preserved and could be utilized for transplantation. First the symblepharon was cured by transplantation of conjunctiva from the left eye. Then an entropion developed which was cured by Snellen's operation.

The transplantation of cornea was done in the following manner: The superficial vascularized layer of the cornea above the former perforation was by cross-section divided into four sections which were dissected and reflected. The cornea was sliced off by four sections with von Graefe's knife. The remaining thin layer was not quite clear, but so transparent that iris and pupil could be distinctly seen through it. An oval shaped flap, 7 mm. by 5 mm., was cut out of the left cornea without opening the anterior chamber, inserted on the right eye and fastened with four sutures at the peripheral margins of the reflected superficial flaps, which were shortened and replaced over the edges of the transplanted piece.

Bloodvessels grew into the transplanted flap, the epithelium of which became at first hazy, but commenced to clear up after about twelve days. After two weeks fingers were counted at $1\frac{1}{2}$ m. and after four weeks at 4 to 5 m. The defect of the left eye healed without disturbance. The border of the cut off vascularized superficial layer of the right cornea, however, commenced to grow like a pterygium over the implanted piece, and was removed.

Plange quotes a similar case of Zirm, and, in concordance with him, emphasizes as the most important points: Vascularization of the base for the nutrition of the transplanted flap, selection of cases, partial transplantation, avoidance of all antiseptics to prevent coagulation of albumen.

C. Z.

OPERATION FOR KERATOCONUS.—GRUNERT, Bremen (*Die Ophth. Kl.*, September 5, 1907), in a case of conical cornea with V.=0.1 with —6 D., Grunert operated by the following method: Cauterization with the electrocautery of the apex of the cone and of a strip 2 mm. wide extending to the limbus. Two days later the cicatrix at the apex of the cornea was removed and the cornea split along the line of the burn. The incision was then covered by a double pedicled conjunctival flap from the nasal side. Two weeks

later the lower loose portion of the conjunctival flap was separated and retransplanted. One month later V. = 0.4 without glass. The conjunctival flap on the cauterized area was smooth but vascular.

W. Z.

A MODIFICATION OF CRICHETT'S OPERATION OF KERATOPLASTY.

BORGHETTI, E., Wellington, New Zealand. In 1863 Crichtett, by total anterior kerectomy, i. e., removal of the anterior portion of the eye, closed the eye with sutures passed through the sclerotic. The objections raised to this operation by Panas and Brudenell were that by passing the needle through the ciliary body hemorrhages and even sympathetic ophthalmia may follow. Borghetti uses the same procedure in the first and second step of his operation as in the DeWecker operation. The different steps are as follows:

1. Detach the conjunctiva from the sclerotic all round, and as far back to the extent of 1 centimeter.

2. Pass a suture all round the conjunctiva close to its margin.

3. A second purse suture is placed a few millimeters behind the corneal margin, taking in the episcleral tissue as well as the superficial fibers of the sclerotic, the suture being a buried one all round except at the lower part of the eyeball, where the two ends of the thread should pierce the conjunctiva and rest on the external side of this membrane.

4. By pulling upon the two ends of the thread the eye is fixed, and by means of a cataract knife, a flap is cut upward, equal in size to four-fifths of the tissue to be removed.

5. As this goes on, the two ends of the suture are pulled upon more and more, so that no sooner has the knife accomplished the cut upwards than the wound is closed and the loosened flap, still adhering to the lower part of the eyeball, is ready to be snipped off level by a stroke of the scissors.

6. The conjunctiva is next brought in front of the eye as in DeWecker's operation.

7. The suture holding the sclerotic is now loosened a little to prevent the ciliary nerves suffering compression, and the two ends of the thread are knotted there.

The following advantages are claimed for this operation:

1. The ciliary nerves suffer no pressure and there is no fear of sympathetic ophthalmia.

2. This method can be applied where other methods cannot, and even when chloroform is contraindicated, and in country practice when intelligent assistance is not easily found.

3. An artificial eye can be placed on the stump and move freely in all directions. G. I. H.

OPTICS.

SIMPLE NOTES ON OBLIQUE PRISMS. —BURDON-COOPER, J. BATTE, England (*The Ophthalmic Review*, March, 1908). This paper deals with: (1) Horizontal and vertical components of an oblique prism. (2) The determination of the numerical value in degrees of any prism placed obliquely in the trial frame, and (3) the simultaneous correction of horizontal and vertical deviations by a single prism. The recapitulation reads as follows: (1) The vertical rectangular component (or equivalent of an oblique prism) is that prism which, placed at 90° , is equivalent in vertical deviating power to the given oblique prism, and is equal to the sine of the angle which the latter makes with the horizontal multiplied by its value in degrees. (2) The horizontal equivalent of an oblique prism is that prism which, placed at 180° , is equal in horizontal deviating power to the given oblique prism, and is equal to sine (90-angle which the latter makes with the horizontal) multiplied by its value in degrees. (3) The resultant of any two prisms which are rectangular components is equal to the square root of the algebraic sum of the squares of the prisms. (4) The ratio of the vertical to the horizontal prism measures the tangent of the angle which the resultant prism makes with the horizontal. C. H. M.

OPTIC NERVE.

SURGICAL INTERFERENCE IN CHOKED DISC.—STIEREN, EDWARD. Pittsburg, Pa. (*Ophthalmic Record*, March, 1908). The position is taken that the skull and dura mater should be opened as soon as the diagnosis of increased intracranial pressure is established, instituting medical treatment afterwards. Three cases are reported, all of which were operated upon, with relief of headache and choked disc. Two of these cases died, respectively, two and three years later. Tumors were found at autopsies. M. B.

AFFECTIONS OF THE OPTIC NERVE DURING PREGNANCY.—KNAPP, ARNOLD, New York (*Arch. Ophth.*, March, 1908, xxxvii, 165), has observed ten cases where the optic nerve and retina during pregnancy and labor showed changes differing from a retinitis albuminurica gravidarum. He classifies them in two groups, one as a toxemia of pregnancy and the other as sepsis. The author reports three cases of neuritic atrophy, without other fundus changes, occurring in pregnant women. He attributes this ocular condition to a toxemia of pregnancy. W. R. M.

CONGENITAL PIGMENTATION OF THE PAPILLA. COATS, GEO., London (*Royal London Ophthalmic Hospital Reports*, xvii, Part ii), reports a case of congenital pigmentation of the papilla occurring in a man aged 69 years. Vision was 6/vi; visual field normal. Below and slightly to the nasal side of the vertical median line of the disc was a large pigmented patch. It was not confined to the disc but about two-thirds was within and one-third was beyond the edge of the disc. From the superior border an elongated tongue of pigmented tissue extended upwards within the nasal margin of the disc. The area of the patch was distinctly swollen, and a retinal artery passed over its surface. Color of the swelling was black. The retina covered the pigmented mass and a translucent, connective tissue film covered the vessels. Fourteen months later there was no change in the appearance of the fundus.

The author makes a differential diagnosis between sarcoma, pathological pigmentation and congenital pigmentation, and bases his diagnosis of the congenital form of pigmentation on the presence of the connective tissue web over the nasal vessels, by the normal visual acuity and full field, and by the absence of alteration after fourteen months of observation. In regard to the nature of the congenital abnormality he believes it to be a melanoma of the chorioid, and bases his opinion on the soft edges of the mass, the appearance of veiling of the periphery by neighboring structures downwards and inwards, which seemed to prove that the mass was deep in the chorioid.

W. R. M.

A STUDY OF THIRTY-SIX CONSECUTIVE CASES OF OPTIC NEURITIS.—FISH, H. M., Chicago (*Ophthalmoscope*, April, 1908). The pathological anatomists report that sinus disease is very common and the clinical cases referred to above show that it can give rise to an optic neuritis; theoretically, then, it should be a very frequent cause of an affection of the optic nerve. Three years ago the writer conceived the hypothesis that idiopathic ocular lesions were often but the symptoms of an affection in the surrounding cavities, and in all cases of optic neuritis the nostrils were examined, and in the recent cases the sinuses were treated, even although in some instances there were no intranasal evidences of sinus disease present. The results were truly surprising, as in a series of 36 consecutive cases sinus disease was found to be present 26 times. The direct causal relationship was shown in 15 cases by improvement in the ocular condition following drainage, and, on *a priori* grounds, the 11 remaining cases were also attributed to the same cause, although the connection could not be demonstrated by any ocular improvement, as most of the cases presented more or less optic

atrophy, while in others the treatment as advised was not carried out. It is conceded that some unknown etiological factor, as, for instance, an intracranial lesion, may have been present in some of the cases in the second series, but we must remember that sinus disease can cause a bilateral optic neuritis, dizziness, pain and vomiting, symptoms that have in several cases led to the diagnosis of tumor cerebri, and yet at the autopsy no tumor was found.

In the 11 influenza cases reported, the optic neuritis was ten times traced to sinus disease; in the one exception with the initial coryza, anosmia, dizziness, and severe pain that induced vomiting, craniectomy was performed, but the sinuses were not properly examined, although the writer strongly urged it; the case terminated in bilateral amaurosis. In the writer's opinion, the more appropriate term for these various cases would be: Optic neuritis, due to sinus disease following influenza, scarlet fever, measles, etc., as the case may be. This hypothesis would explain the appearance of the ocular lesion, as a rule, during convalescence, or, in some cases, long after recovery.

Three of the observations reported are cases of glaucoma, two primary and one secondary. In each instance the affection of the sinuses was clearly present, and the causal relationship was shown by the improvement in the ocular condition following the drainage of the cavities.

M. B.

THERAPEUTIC RESULTS OF LUMBAR PUNCTURE IN OPTIC NEURITIS OF INTRACRANIAL ORIGIN.—BALINSKI and CHAILLOU'S (*Annales d'Oculistique*, July, 1907). The therapeutic value of lumbar puncture in ocular pathology has not been thoroughly studied. A few authors only have incidentally noted its favorable effect in certain affections of the optic nerve. According to the observations of Druault, papillary edema, as well as other symptoms of cerebral compression, may disappear after evacuation of cerebrospinal fluid, but the result is far from being constant. Quincke joined a vertical glass tube to the needle used to make the puncture to enable him to measure the pressure of the cerebrospinal fluid and establish the relation between intracranial hypertension and the symptoms that are attributed to it. In this way, in case of choked disc, lumbar puncture may aid the diagnosis, and it may be repeated if it causes any improvement.

The authors report eight cases of swollen disc treated by lumbar puncture.

Case 1 was a traumatic one, the result of a fall upon the head. After the withdrawal of fifteen centimeter cubes of cerebrospinal fluid, there was immediate improvement, and ultimately complete

return to normal. Case 2. In addition to the swollen discs there were paresis of the right exterior rectus, violent headache, etc., all probably due to a meningitis of unknown etiology. Two lumbar punctures were made, with an interval of about a week, and were followed each time by improvement in the symptoms. Seven or eight intramuscular injections of calomel were also made. Complete recovery resulted. In case 3, also due to meningitis of obscure origin, there was blindness of the right eye and considerable diminution of vision in the left. O. D., no light perception, O. S., vision equaled fingers at twenty centimeters. After withdrawal of twenty centimeters of cerebrospinal fluid, the headache and vomiting disappeared. A few days later the puncture was repeated with immediate improvement of ocular symptoms. Mercurial treatment was also applied. The final result was recovery with V. = $\frac{7}{x}$ in each eye. Case 4 was one of meningitis, probably syphilitic. Vision and field normal in each eye, but vision disturbed by diplopia from paralysis of left exterior rectus. There were marked edematous neuritis of both eyes and retinal hemorrhages in the right. Lumbar puncture, which showed a decided lymphocytosis of the cerebrospinal fluid, was followed immediately by improvement in the appearance and the swelling of the papilla, and the diplopia disappeared. Injections of iodid of mercury were used. Case 5. Meningitis of unknown origin. Papilla edematous and swollen, paralysis of external rectus, fields contracted. O. D. $\frac{5}{xxx}$, O. S. $\frac{1.5}{50}$. Twenty-five cubic cm. of cerebrospinal fluid evacuated by puncture and ten minutes afterwards V. O. D. $\frac{5}{xv}$, O. S. $\frac{2.5}{50}$, and visual fields enlarged by 10° . Iodid and mercury administered. A few days later the diplopia had disappeared and the swelling of the discs had diminished. Result two months later, discs flat but somewhat pale and V. $\frac{5}{xv}$ in each eye.

Case 6. Meningitis, violent headache, etc., and double optic neuritis. V. O. D. $\frac{5}{x}$, O. S. $\frac{5}{x}$. Injections of calomel. A week later no improvement in symptoms. Immediately after puncture V. O. D. $\frac{8}{x}$, O. S. $\frac{9}{x}$. Later the papilla were almost normal, but subsequently the nervous and ocular symptoms increased and the vision diminished.

Case 7. That of a hydrocephalic child one year old. Double optic neuritis had been noted eight months earlier. In three months four lumbar punctures were performed. There was improvement in the child's general condition and the swelling of the nerves diminished. Mercurial inunction was also used.

Case 8. Cerebral tumor with right hemiplegia and troubles of speech. Jacksonian epilepsy. Ophthalmoscopic examination nega-

tive. Mercurial treatment. Several months later typical double edematous neuritis. After seven or eight punctures there was transient diminution of papillary edema, but later it increased. A tumor was removed by operation and the patient died immediately afterwards.

The relief, sometimes so immediate, of visual trouble following lumbar puncture, favors the theory of Dupuy-Dutemps (recently abstracted in this journal) who claims that pupillary edema is due to compression of the central vein in its passage through the dural sheath.

The authors conclude that lumbar puncture should be considered a therapeutic measure in case of papillary edema due to traumatism or inflammation, while in intracranial tumors it can be only palliative. That it is well to repeat the puncture as often as may seem necessary to avoid the effects of compression, particularly, atrophy of the optic nerve.

G. C. H.

LUMBAR PUNCTURE IN OPTIC NEURITIS FROM INTRACRANIAL HYPERTENSION.—FRANKEL (*Annales d'Oculistique*, January, 1908). Lumbar puncture, while considered palliative in tuberculous meningitis, has a number of cures to its credit in the non-tubercular forms. It appears to be particularly effective in the clinical type described by Quincke under the name of serous meningitis. In many cases of meningeal hemorrhage, particularly the traumatic, the method may be indicated when there is no urgent necessity to evacuate the blood. Palliative results are obtained in hydrocephalus. In optic neuritis from cerebral tumor prudence should be used in treatment by lumbar puncture, as in some cases sudden death has followed it, and in others there has been an aggravation of the nervous symptoms, particularly of headache and vomiting. In the uremia of Bright's disease there may be real relief, though only of symptoms. In labyrinthic diseases of the ear lumbar puncture diminishes the vertigo and tinnitus and even the deafness.

In all three cases the effect is obtained by diminution of the tension produced by the excess of cerebrospinal fluid. There is a very reliable clinical sign of this hypertension in the optic neuritis of stasis, and the diagnostic and therapeutic value of lumbar puncture in optic neuritis has attracted the attention of neurologists and ophthalmologists, as is shown in the communication of Babinski and Chaillous (recently abstracted in this journal).

The author reports the following case: A rather delicate girl 21 years old applied for treatment in May. Since December she

had had intermittent headache increasing in violence. Later there were diminution of vision, photophobia, blepharospasm and convergent strabismus with diplopia. Ophthalmoscopic examination showed well marked double optic neuritis with swollen discs, shrunken arteries and dilated and tortuous veins; temperature and pulse practically normal. In the last of May there was increased headache with vomiting and convulsions. In June the patient became comatose and 8 c. cm. of clear cerebrospinal fluid without albumen and free from lymphocytes were withdrawn by lumbar puncture, with immediate and marked improvement of the symptoms. June 7, the headache and convulsions returned and the puncture was repeated with immediate relief. There was recurrence of symptoms from time to time but gradual improvement, and at the last of June a considerable increase of vision was noted and the papillæ were less swollen. Mercurial treatment had been administered. On July 6 V. = 1, and fundus practically normal.

The author thinks that the symptoms and history of the case justify the diagnosis of serous meningitis and that the cure was due to the lumbar puncture, though the effect of the mercurial treatment cannot be excluded.

G. C. H.

ATROPHY OF THE OPTIC NERVE CONSECUTIVE TO AN ACUTE DACRYOCYSTITIS.—VILLARD (*Annales d'Oculistique*, July, 1907). After chronic epiphora there was a sudden onset of dacryocystitis and two fistulæ formed. There was great swelling of the lids and face, chemosis and exophthalmos. Vision was entirely abolished and the optic nerve was atrophied. The author states that the accident is rare and that he has been able to find only seventeen cases reported in literature.

G. C. H.

CONSIDERATIONS ON APHAKIA.—LAQUER, Strassburg (*La Clinica Oculistica*, January, 1908). By aphakia we mean the absence of the crystalline lens in the dioptric system of the eye and it is a concept purely optical, not anatomic. The common causes of aphakia consist in the operation for cataract, and in wounds which have determined a complete removal or destruction of the lens system. The diagnosis is based on the demonstration of the remains of capsule, of thickening or folding up of the posterior capsule, of a pigmented membrane on oscillation of the iris, and on hyperopia of high grade. The symptoms are more obscure when the pupil is perfectly black and lets pass normally luminous rays and gives reflexes of the crystalline. Attention should be especially directed to the presence or absence of the posterior image. The

diagnosis of aphakia may present difficulties, but is made sure by the absence of the posterior image of the lens. The aphakic eye represents the simplest dioptric system because it contains only the anterior plane of the cornea and the indices of refraction of the cornea, the aqueous and the vitreous which have practically the same value. It sometimes happens that after cataract operations erythropsia develops. Rarely it shows itself a short time after the operation. Usually it shows itself a few months afterwards and lasts a few hours to be repeated often. It has also been observed in traumatic lesions of the lens after absorption of the cataract. As a rule it manifests itself towards evening and after great physical effort. According to Fuchs this is due to the fact that the peculiar visual purple becomes visible. The visual purple becomes pale through the prolonged action of bright light, but regenerates rapidly in darkness, and this regeneration is perceived by the eye. Vision in aphakic eyes is normal in extremely rare cases.

R. H. J.

PARASITES.

CYSTICERCUS INTRAOCULARIS. — LANGE. Braunschweig. (*Die Ophth. Kl.*, September 5, 1907), found the cysticercus after enucleation. The patient was a male, 29 years of age. During the previous year the eye had become blind without inflammatory phenomena. The pupil did not react. Behind the lens there was a fixed yellowish-gray tissue mass traversed by bloodvessels. Transillumination gave a yellowish-green pupillary reflex. Diagnosis was intraocular tumor. Pathological findings were total funnel-shaped detachment of the retina with behind and laterally, an encapsulated cysticercus 12 mm. in diameter. The intermediate vitreous had undergone fibrous degeneration. The anterior portion in contact with the lens was vascular.

W. Z.

HISTORY OF A CASE OF SUB-RETINAL CYSTICERCUS—LOPEZ, FERNANDO, City of Mexico (*Ann. Ophthal.*, October, 1907). The wife of a distinguished physician had a tape worm and presented an ophthalmoscopic picture of a small yellowish-white spot, situated just above and to nasal side of the disc. It was seen to lie beneath the retina and was pushing the latter forward into the vitreous. During two months' observation the growth increased in size, encroached upon central vision, caused a rupture of a vessel running over it and some retinal detachment. No movement was ever detected. A diagnosis of cysticercus was made and operation decided upon. A conjunctival incision was made above and the superior rectus tenotomized, the muscle secured, the ball

rotated as far down as possible. The sclera was incised as far back as possible with a cataract knife, the lips of the scleral wound held apart with small Stevens' strabismus hooks, a few drops of adrenalin dropped on the exposed chorioid, and the chorioid then incised with scissors. A Lewis spoon was now introduced into the wound toward the posterior pole of the eye, and the vesicle soon presented in the lips of the wound and was delivered without trouble. The scleral wound closed of its own accord, the rectus muscle was sutured to its stump with catgut, as was the conjunctiva. The result was a perfectly normal looking eye with damaged vision. The cysticercus belonged to the tenia solium. M. B.

A CASE OF ALVEOLAR ECHINOCOCCUS OF THE LEFT EYELID. — ORLOFF (*Annales d'Oculistique*, February, 1908). The author follows Melnikoff-Razwedenkoff in giving the name of alveolar echinococcus to the cysticercus. Though its occurrence in the eyelid is comparatively rare, some eighty cases have been published and in two-thirds of these the patients were 20 years of age, while generally these affections occur in other organs at 30 or 40 years.

The case reported is that of a robust young woman 20 years of age, in excellent health. She had noticed the appearance of a small tumor in the left upper eyelid four months previously. Under the skin near the border of the cartilage there was a sharply defined, elastic, oblong, mobile tumor. When it was removed, it was found to have been intimately adherent to the orbicular muscle and in its consistence and form it resembled a fibroma.

Microscopic examination showed it to be an alveolar echinococcus in an early stage of development.

Although the differences between an alveolar echinococcus and an unicellular one are marked, they were formerly considered identical. It is well known that the alveolar form is an independent one. The alveolar echinococcus extends in the organism either by continuity or by metastasis through the bloodvessels and lymphatics.

The health of the patient was so good that it is difficult to admit the presence of a nucleus in the internal organs, and the author considers the palpebral tumor as a primary nucleus.

G. C. H.

PATHOLOGY.

CONCERNING THE PATHOGENESIS OF ANTERIOR SYNECHIA. — SOMMER, Mayen (*Wochschr. f. Ther. u. Hyg des Aug.*, Feb. 13, 1908), records an instance where the anterior synechia was not the result of a previous perforation of the cornea. The case was

one of infected ulcer with deep hypopion. During resolution the exudate organized and drew the iris forward and the cornea backwards leaving a fine firm short strand surrounded by aqueous humor and connecting the middle portion of the lower half of the iris with correspond overlying leucomatous area of the cornea.

W. Z.

EXPERIMENTAL INVESTIGATIONS ON THE CAUSES OF PANOPHTHALMITIS. —ABE, Nakes. Kyoto, Japan (*Beitrag zur Augenheilkunde*, lxx p. 541, 1908), gives a review of the abundant literature from which it appears that panophthalmitis after injuries of the eye by splinters from harrows may be caused by various bacteria. On the other hand, it is not ascertained whether the bacillus subtilis may create panophthalmitis. Abe therefore made new experiments on the etiological importance of micro-organisms of the hay bacillus group, under the guidance of Professor Matsushita. He studied the influence of a great number of bacteria on the eye under various conditions, taking them from fields, woods, streets, gardens, floor-dust, hay, grass, straw, moss, rice, malt, feces of man and animals, etc. He thus bred 23 kinds of bacteria in bouillon.

The experiments, which are recorded in detail, were made thus: (1) O. 1 c. cm. were injected into the vitreous of left eye, O. 1 c. cm. into the anterior chamber of right eye of a rabbit. (2) Bacteria were rubbed with the platina oese into a wound of the cornea of a second rabbit, made with a sterilized needle. (3) A third rabbit (1 c. cm.), a guinea pig (O. 5. c. cm.), and a mouse (O. 2. c. cm.) were subcutaneously inoculated for ascertaining the general pathogenicity.

The virulence of the bacteria varied with the material they came from. Seventeen of the 23 kinds of bacteria, mostly saprophytes, produced panophthalmitis. While injections into the vitreous and the anterior chamber very frequently caused panophthalmitis, suppuration from subcutaneous injection was rarely observed, never panophthalmitis after rubbing bacteria into the wounded cornea. The bacillus subtilis being extraordinarily common, the opportunity of its entering the eye upon injuries by harrow-splinters is much greater than for other bacteria. Therefore bacillus subtilis appears to be, but actually is not, the only morbid agent of panophthalmitis after injuries of the eye by splinters of harrows.

Hence Abe concludes that the causes of panophthalmitis are multiple. The experiments also showed that the cornea and other external parts of the eye have a great resistance against microbes

and that it is impossible that the bacteria, generally inhabiting the conjunctiva, e. g., bacillus subtilis, enter through the normal or slightly injured cornea, conjunctiva, etc., into the vitreous and produce panophthalmitis.

THE PATHOLOGY OF COLOBOMA AT THE NERVE ENTRANCE.—COATS, GEORGE. London (*Royal London Ophthalmic Hospital Reports*, xvii, Part ii), discusses the pathology of "coloboma of the optic nerve," or, as he prefers to term it, "coloboma at the nerve entrance," with special reference to the anatomy of this somewhat rare congenital abnormality. He adopts the classification of Casper, with regard to the arrangement of vessels, as follows: "1. The lower part of the coloboma is most deeply excavated, and from it the vessels spring. Their general direction is upwards, so that those destined for the lower half of the fundus must make a sharp bend downward over the deeply excavated lower edge. The superior vessels take a more direct course to their destination over the less excavated superior border. 2. The vessels arise with something like their normal arrangement either from the center of the coloboma, or from a point towards its upper border. 3. The vessels emerge separately from one another at some distance from the center of the excavation, or even quite at its edge. In the latter case the retina appears to be entirely supplied by cilio-retinal branches."

On clinical grounds the author makes a distinction between "coloboma of the optic nerve" and "coloboma of the chorioid adjacent to the nerve." In the latter the defect is more or less triangular and the boundaries of the papilla are fairly distinct and separated from the floor of the coloboma. In "coloboma of the nerve" an enlargement and excavation of the nerve itself are simulated.

The author reviews the published cases dealing with the anatomy of coloboma at the nerve entrance and reports three cases that have come under his observation. In two cases the globes were obtained from an anencephalic child that died 36 hours after birth. Microscopical examination showed the nerve fiber layer of the retina to be totally absent. All other layers of the retina normal. At the lower edge of the nerve was a deep pocket filled with altered retinal elements. It extended backwards in the lower part of the nerve and the defect was entirely within the limits of the nerve. There was no trace of atrophy, thinning or inflammation, and the pigment epithelium lined the entire excavation. There were no blood vessels present within the abnormal pocket. In the third case the specimen was obtained from a child ten months old. There

was a large meningo-encephalocele of the right orbit which displaced the eye downwards and outwards. Ophthalmoscopically there was visible a deep coloboma at the nerve entrance as well as a macular coloboma and an excavation on the nasal side of the papilla. Microscopical examination showed a deep excavation in the temporal portion of the nerve entrance, the nerve itself being spread out over the wall on the nasal side. On the nasal side the papilla was greatly elongated and its direction was at right angles to the normal. The chorioid and sclera ended in normal relation to each other. The floor of the excavation was formed of dense fibrous tissue, and a large portion of the surface of the cyst was lined with a layer of nerve fibers closely in contact with the fibrous tissue lining the bottom of the cyst.

The author endorses the statement of v. Hippel that the lesions, even in cases which closely resemble each other clinically, present no uniformity microscopically. He also emphasizes the important fact that it is impossible from the ophthalmoscopic appearances to predict what the microscope will reveal.

Pathologically he classifies the cases as follows:

1. The lesion is a coloboma of the chorioid beneath the nerve, the nerve itself being normally formed, and sharing only passively in the deformity.
2. The lesion is a coloboma of the chorioid and nerve.
3. The lesion is a coloboma of the nerve alone, the adjacent chorioid being normal.

The three cases described by the author were true colobomata of the nerve alone.

W. R. M.

THE PATHOLOGY OF RUPTURES OF THE MEMBRANE OF DESCemet.—COATS, GEO., London (*Ophthalmological Society's Transactions*, vol. xxvii), describes the various forms which rupture of Descemet's membrane may take and the subsequent changes which they undergo, giving the results of his observations in cases of infantile glaucoma, myopia and conical cornea. He gives an historical account of rupture of the membrane of Descemet from the first anatomical description of this condition as given by Becker in 1875. He then gives his personal observations based on the study of thirteen cases of buphthalmos, eight of glioma with increased tension, and four of myopia of high degree. Ruptures were found in all cases of buphthalmos except one. In eight cases of glioma they were present twice, while he failed to find any in uncomplicated myopia, but found them in one case of myopia associated with glaucoma. The author attributes their absence in high

myopia to the fact that in myopia it is the posterior hemisphere of the globe that stretches and not the anterior. Coats states that in microscopical preparations the fissures are more numerous and extensive in the periphery of the cornea where the stretching and thinning is greatest in buphthalmos. In the author's cases the endothelium was always intact over the gap, and he believes that the preservation of the transparency of the cornea is due to that fact. He mentions a rare form of rupture in which overlapping of the edges occurs instead of spreading apart, due to a relaxation of the heightened intraocular tension after the occurrence of the rupture. The subsequent changes consist of processes of repair by the deposition of new membranes, or masses of similar substance, from the endothelium, and this occurs in an imperfect manner.

The author gives the essential cause of rupture of Descemet's membrane as stretching of the cornea, and states that the term "elastic" as applied to it is a misnomer and that it is inferior in elasticity to the corneal lamellæ, as evidenced by the fact that when divided it assumes curly and spiral forms instead of retaining its original form.

Notes are given on clinical cases, the article is illustrated and a bibliography is appended.

W. R. M.

PHYSIOLOGY.

THE PERCEPTUAL FACTORS IN READING. HAMILTON, F. M. New York (*Archives of Psychology*, December, 1907) lays stress on the influence of context in word recognition. From the age of nine or ten up to maturity, the phrase, the sentence, the paragraph, etc., have each a measurable value as aids in the perception of words. Within the area of relatively clear vision, certain portions, only, are selected, viz., the focal area, that of distinct attention, and that of the right hand marginal impressions, which together constitute the "reading field." Besides the distinction between margin and focus there are within the focal area further distinctions corresponding to the separate word impressions, coming to full recognition in the order in which the words themselves appear from left to right. When the words are strange or difficult, additional distinctions within the word are required. Supplementary to the purely reflex, attentional, movements of the eyes in reading, are the peculiar habits of eye movement noticeable particularly in very rapid readers, tending to reduce the amount of variability of movement between the reading pauses.

P. H. F.

EXPERIMENTS ON TIME RELATIONS IN BINOCULAR VISION.—SEVENSON, T. J., and SANFORD, E. C., Worcester, Mass. (*Amer. Journ. of Psychology*, March, 1908), tried to determine what time interval, if any, may be inserted between the presentation of each picture, in a stereoscopic pair, to its proper eye, without interfering with the perception of relief. They conclude that practically no interval whatever can be so inserted, a stereoscopic vision depends strictly upon simultaneous excitation of the two halves of the visual apparatus. Experiments apparently showing a contrary result, were vitiated by the persistence of after images. When the time interval between the pictures is great enough to interfere with the usual stereoscopic apprehension of the diagrams, their parts are apperceived as in motion. As the interval is shortened, and the conditions become more favorable to the apprehension of stereoscopic relief, the relief seems to come in, not suddenly, in full amount, but gradually, indicating that stereoscopic vision is due to a reflex tendency of the eyes to fixate the different portions of an object seen in relief. Binocular vision should be regarded as the physiological result of a certain balance or distribution of excitations in a symmetrically constructed but unitary visual apparatus, not as an actual psycho-physical fusion of two simultaneously present but independent monocular images. P. H. F.

THE INTERMITTENCE OF MINIMAL VISUAL SENSATIONS.—FERREE, C. E., Bryn Mawr (*Amer. Journ. of Psychology*, January, 1908), finds that the fluctuation of the negative after-image represents a real intermission of sensation. It is not an artifact, due to observation under the conditions of light adaptation, as it occurs as readily in a darkened as in a light field of vision. Fluctuation is not grounded in the nature of the after-image process. It is caused chiefly by involuntary eye movement, which decreases the duration of the negative after-image by conditioning or modifying the streaming over the retina of some material capable of affecting the visual processes. The intermittence is a phenomenon of adaptation. Eye movement decreases the total time of stimulation, and affords time for the after-image to die away. P. H. F.

REACTION OF BLINDED LOBSTERS TO LIGHT.—HADLEY, P. B., Brown University (*Amer. Journ. of Physiology*, March, 1908), has already shown that normal lobster larvæ react to light by placing the long axis of the body parallel to the light rays with the head away from their source, swimming either toward or from it. Any change in direction of the light rays striking the eyes of the larvæ, determined a new direction of swimming. A change in inten-

sity could reverse the motion. This reaction may be explained by a difference of illumination of the two eyes, directive influence, and a tendency to select an optimum illumination, and to remain therein, when both eyes are illuminated equally. Stimulation of one eye causes increased activity of the swimming apparatus of that side, tending to bring the head around to face the light squarely and thus equalize the illumination of the two eyes. In unilateral blindness, there is loss of reaction, and of motion on the blind side, and the larva swings until the uninjured eye is in shadow.

When both eyes are blinded there is no reaction, either to the directive influence, or to differences in the intensity of light.

P. H. F.

THE REACTION OF PLANARIANS TO LIGHT. WALTER H. F. Cambridge (*Journ. of Experimental Zoology*, v, No. 2), finds that light is not an essential factor in planarian activities, since the behavior necessary to the welfare of the individual and the race is mainly referable to other factors. A planarian's response to light is of a passive character, which may have an adaptive significance only in so far as its phototaxis tends to conceal the worm from its enemies. The presence of pigment may also be regarded as an adaptive condition induced by the animal's relation to light. The evolution of the photo-receptive apparatus of the planarian has not reached the degree of differentiation necessary to enable it to secure for itself such adaptations to the factor of light in its environment as would make aggressive activity possible to it in a manner characteristic of higher animals.

P. H. F.

EXPERIMENTS ON THE ORIGIN AND DIFFERENTIATION OF THE OPTIC VESICLE IN AMPHIBIA.—LEWIS, W. H., Baltimore (1901. *Journ. of Anat.*, vii, No. 2), notes that if one transplants a small piece of the eye region of a frog embryo, even before there is any histological differentiation, from the anterior end of the medullary plate to the mesenchyme of the otic region of an older embryo, the piece will continue to differentiate into eye and brain tissue: the various layers of the retina, including the pigment layer, will develop, and invagination will take place. Such transplanted eyes as a rule have no connection or contact even with the central nervous system of the host, each eye being surrounded by mesenchym. Among the transplanted eyes there are many interesting variations in size, shape, and differentiation, depending mainly on the amount and distortion of transplantation. Invagination may fail entirely, and the eye remain a vesicle. If part of the normal optic vesicle be allowed to remain, regeneration takes place, and this may result

in an eye two-thirds or three-fourths the diameter of the transplanted eye and normal eye. Thus the regenerated and transplanted eye together may be nearly twice as large as an eye the same optic vesicle tissue would have produced under normal conditions, and the cutting away a portion of it must have disturbed in some way the regulative mechanism. Lenses were associated with several eyes transplanted from *Rana sylvatica* into the preotic region of *Amblystoma* (salamander), while the normal lenses of the latter were also present.

P. H. F.

LENS FORMATION FROM STRANGE ECTODERM IN *RANA SYLVATICA*.—LEWIS, W. H., Baltimore (*Amer. Journ. of Anat.*, vii, No. 1), has already shown that the optic vesicle can stimulate a lens to arise from strange ectoderm in frogs of the palustrine variety. Transplantation of the vesicle into other regions of the body was the most successful method. Only the earlier stages of lens formation were then shown. In the present series the author experimented on *R. sylvatica* to determine the possibility of such ectopic lenses developing normally. The lens is not a self-originating nor a self-differentiating structure, and it seems that only the retinal portion of the eye is capable of stimulating lens formation. Contact between optic vesicle and ectoderm is also necessary, as the former has no power of acting at a distance. The conclusive evidence of the ability of the transplanted eye to stimulate lens formation from strange ectoderm is to be found when such eyes are associated with lenses or lens-like structures that are still attached to the ectoderm of the strange region. Lens formation appears to be a purely local process, requiring no connection of the transplanted eye with the brain.

P. H. F.

REGENERATION IN COMPOUND EYES OF CRUSTACEA.—STEELE, MARY ISABELLE (*Jour. of Experimental Zoology*, v, No. 2), put her chief aim in accurately describing the histogenesis of the regenerated structures, in the belief that it will contribute something toward a more accurate understanding of the more general problem of regeneration. The problem has separated itself into three main divisions: First, the regeneration of a functional eye; second, a search for the causes of no regeneration and abnormal regeneration; and third, observations upon the heteromorphic regeneration which may follow the removal of the entire eye.

The writer comes to the following conclusions: The healing of the wound takes place by the formation of a provisional crust over the cut surface and later by the development of a new cuticle beneath this crust. The new cuticle is continuous with the inner

layers of the cuticle over the eye stump. New hypodermal cells over the ommatidial region may arise in two ways: either by the transformation in situ of corneal hypodermal cells into less specialized, actively multiplying hypodermal cells inward from the edges of the cut, or by the proliferation of new hypodermal cells inward from the edges of the cut. Any injury to the eye is always accompanied by extensive degeneration of the remaining tissues. Sometimes the entire eye suffers destruction. The rate of regeneration is considerably affected by the rate of disintegration and the removal of injured parts. Active regeneration may be in progress at the periphery, while deeper below the surface the injured structures are not yet removed. In the regeneration of an eye all of the new structures arise from the hypodermis. Multiplication of cells takes place by amitotic divisions. The cells for the retinulae are the first to differentiate from the hypodermis. The reticular nuclei move inward from the periphery, elongate and divide along their radial axes, and extend proximal processes through the basement membranes to the optic ganglion. Thereby nervous connections are established in the regenerating region. Not until after the reticular processes have extended into the optic ganglion is the differentiation of cones established. The cones differentiate from the periphery inward. The rhabdom is developed from the inner ends of the reticular cells and is at first present as a slender, homogeneous rod of uniform diameter, which extends from the inner end of the cones to the basement membrane. The spindle-shaped enlargement of the rhabdom does not appear until after all the other parts of the ommatidium have been differentiated. The hypodermis does not become a true corneal hypodermis and secrete corneal facets until after all of the other ommatidial structures have been differentiated. Corneal facets are never apparent after more than one moult has taken place. Ommatidia do not differentiate at a uniform rate in all parts of the regenerating eye. In *Palæmonetes* (the common shrimp) regeneration of perfect ommatidia does not take place if the optic ganglion has been injured. Hermit crabs may regenerate a perfect eye after removal of as much as half the optic ganglion. Crangon (the sand shrimp) regenerates an eye very slowly, even when the optic ganglion is uninjured, but there are evidences that ommatidia may differentiate after a part of the optic ganglion has been removed. The rate of regeneration is quite variable in all the species experimented upon, but both hermit crabs and *Palæmonetes*, however, may regenerate ommatidia within thirty-five to forty-five days. Splitting of the eye of

Palæmonetes is not followed by regeneration if the split extends into the optic ganglion. In the breaking down of the injured ommatidia the pigment secreting cells become widely scattered, and the old pigment persists for a long time. Frequent cases of abnormal development of pigment also occur. There are evidences which indicate that this abnormality is due to the pathological development of the broken down retinulæ. After removal of all or nearly all of the optic ganglion hermit crabs may regenerate a heteromorphic appendage in place of the excised eye. There is, however, apparently a level from which neither an eye nor an antenna-like appendage will regenerate. The nerve-trunk of the heteromorphic appendage forms a continuous structure with the stump of the optic nerve. Removal of the entire eye of *Crangon* may also be followed by the regeneration of an antenna-like appendage. In no case was there evidence that *Palæmonetes vulgaris* possessed the ability to regenerate a heteromorphic appendage after the removal of the entire eye. The results of the experiments point to the conclusion that the regeneration which takes place from any level is largely influenced by the presence or absence of the whole or a part of the optic ganglion.

E. E. B.

THE SENSE OF SIGHT IN SPIDERS.—PETRUNKEVITCH, ALEXANDER (*Jour. of Experimental Zoology*, v, No. 2), begins his "Studies in Adaptation"—in the anatomical sense, not in the physiological—with the sense of sight in spiders, as this sense is of the greatest importance, especially for those which obtain their prey by hunting. The larger eyes of an individual are more sensitive than the smaller ones of the same individual; the eyes of the young spiderling are less sensitive than the same eyes in the adult; we may be sure of the proportional sensitiveness of the eyes. Changes take place in the directions of the eye-axes during development. All this goes to show unmistakably the existence of a perfect balance between function and structure in the eyes as well as a remarkable degree and an extraordinary rapidity of adaptation. Thus when the spiderling first begins to lead an independent life, it finds in its eyes an organ already sufficiently perfect to be relied upon in the struggle for existence. The changes in the angles of the eye-axes may well be looked upon as an adaptation. The slower growth of the eye-group as compared with that of the cephalo-thorax is to be considered advantageous. In the individual the increasing acuity of vision is brought about as a consequence of the slower growth of the retina elements compared with that of the lens.

The acuteness of vision even in the sharpest-eyed spiders is far inferior to that of man. The anterior middle eye (AME) of *Phidippus* (a large jumping spider of northern America) and the posterior middle eye (PME) of *Lycosa* (a common large ground spider belonging to the same region), the two most sensitive eyes will be compared with the average human eye. One square centimeter placed at a distance of 30 cm. occupies somewhere in the neighborhood of $114^2 = 12,996$ cones in the human eye, $13^2 = 169$ rods in the AME of *Phidippus* and only $2^2 = 4$ rods in the PME of *Lycosa*. The minimal angle of vision equals $8'$ for the AME of *Phidippus* and about $60'$ for the PME of *Lycosa*, while from observation of the double stars it is known that the smallest angle of vision in man equals $1'$. Thus a creeping insect about 1 sq. cm. in size would be perfectly visible to the human eye, even perhaps to the extent of recognizing the species, at a distance of about 3 m., while it would appear merely as an indefinite, tiny moving speck to *Phidippus* and would be entirely beyond the range of vision of *Lycosa*. The poor visual power of spiders is largely due to the peculiar form of the retina, while the inferiority in this respect of *Lycosa* to *Phidippus* depends on the fact that, while in the latter the retinal image covers the terminations of nearly 7 nerve-rods, in the former it scarcely exceeds the diameter of a single rod. E. E. B.

ON THE YELLOW COLOR OF THE MACULA. CHEVALLEREAU AND POLACK (*Annales d'Oculistique*, October, 1907). After a comprehensive review of the literature of the subject, the authors find that, though most authorities admit the existence of the yellow coloration of the macula in the living eye, this fact is not accepted without dispute. They conclude that the presence of the yellow pigment at the macula is demonstrated by anatomical examination, entoptic observations, physiological reason, and considerations of functional utility.

In their own observations they examined seven retinas of eyes just removed for affections of the anterior segment. The retina was separated from the chorioid and spread upon a plate of glass and in the region of the macula a yellow color was always distinctly noted. As less than two minutes passed between the removal of the eye and the examination of the retina there could be no question of cadaveric change. The pigment preserved its color for several months. Examined spectroscopically it affected the most refrangible rays of the spectrum, the maximum of absorption being in the blue region. G. C. H.

A METHOD OF OBTAINING SECTIONS IN SERIES OF THE OCULAR GLOBE IN CELLOIDIN.—CALDERARO, Palermo (*La Clinica Oculistica*, January, 1908). The globe is enclosed in an abundant mass of celloidin. The slow evaporation is provided for by keeping the block under a bell jar which has an opening for a phial filled with chloroform. Every three or four hours the block is wiped dry of the chloroform which collects on it. After two days all parts of the celloidin are equally hard but somewhat shriveled. The block is then placed under the jar without chloroform and in three or four days, according to the temperature, it has the proper hardness. A few peripheral layers are now removed with the microtome. The regularity and thinness of the sections being obtained, the cut surface is smeared with a syrupy solution of celloidin which is allowed to evaporate slightly. In a half or one minute the desired dryness is obtained; this is determined from the fact that the celloidin does not stick to the finger. The sections are immersed in ordinary alcohol and then in phenic acid xylol 2; this liberates some of the added celloidin and in such a manner that an uninterrupted series of thin sections (15 to 30 m.) of the entire globe can be obtained. R. H. J.

RETINA.

PIGMENT STREAKS IN THE RETINA.—PAGENSTECHE, Heidelberg (*Graefe's Arch.*, lxvii, H. II, January 21, 1908) records two instances of "angioid streaks in the retina." The first was seen in a man 60 years of age. The family and personal history was good except that the patient was an excessive user of tobacco. In both eyes beginning at the papilla and involving the greater part of the fundus there were numerous gray-brown lines which were quite sharply defined against the dark red fundus. These lines were plainly beneath the retinal vessels which frequently crossed them. By cursory examination they could be readily taken for vessels because of their caliber and their dichotomous branching. But nowhere was a blood column visible. In size they varied from a mere thread to twice the width of a retinal vessel. The pigmentation varied in a given streak. At times the continuity was broken. In the vicinity of the temporal border of the disc there appeared a similar somewhat broader pigment streak from which sprang streaks which extended in all directions but were lost at the equator. In the one eye one of the streaks was of a bright red color. Nowhere were the streaks connected with the retinal circulation. A year later there appeared, in the macular region, a pigment

streak which had developed from a previously existing hemorrhage. There was also a small fresh hemorrhage.

The second case occurred in a man 21 years of age who first presented a reddish brown pigment streak in the retina in connection with a patch of macular chorioiditis. Two years later no change had taken place but two years later still the pigment line was accompanied on either side by a white streak. The maximum width of the line was 0.2 of a disc's diameter. It was more wavy and irregular in caliber and branched more freely. In the macular region there was an irregular triangular glistening white area like connective tissue with included pigment.

The author thinks that Lister's explanation has much to commend it. This writer accidentally found in the histological study of two eyes, bloodvessels filled with pigment in the deeper layers of the retina. In the one eye these vessels appeared to be connected with the vessels of the optic nerve; in the other eye they were in connection with the vessels of the ciliary body. Lister concluded that also in typical pigment streaks of the retina may consist of new formed bloodvessels in the deeper layers of the retina. The author agrees with Lister that they consist of new formed bloodvessels. The more or less considerable pigment heaping found in the fundus in all of the cases speaks for a chronic inflammatory process in the retina or perhaps chorioid as the cause of the vessel formation. The origin of these vessels, whether from the optic nerve, chorioid or ciliary body, is still in doubt.

W. Z.

ON FORMATION OF CENTRAL HOLES IN THE RETINA.—TWIERMEYER, J. (From the eye clinic of Prof. O. Schirmer in the University of Greifswald. *Zeitschrift für Augenheilkunde*, 1907, xviii, p. 447), reports two cases, caused by contusions of the eyeball through blunt objects. The macular region was at first opaque, the veins engorged and tortuous. From about ten days to three weeks a round hole, half the size of the optic disc, had formed at the macula, the depth of which was of a marked lower level than the surrounding retina. It was red and was covered with white dots, and surrounded by a diffuse grayish opacity, gradually passing into normal retina. In the second case this opacity showed also a great number of shining yellowish crystals. Subjectively a central scotoma corresponded with the seat of the affection.

C. Z.

DETACHMENT OF THE RETINA CAUSED BY TRAUMATISM OF THE HEAD.—REMAK, DE., Glogau (*Centralblatt für praktische Augen-*

Wittkowski, 1907, p. 262). A woman, aged 57, had an extensive detachment of the upper portion of the retina, commencing above the upper temporal retinal vessels with a rupture at the upper lateral periphery. It was gray, very prominent, but not floating. The vitreous body contained large opacities. V. = 5/x, with defect of the lower half of the visual field. After the patient had been treated with lying in bed, diaphoresis, iodid of potash, for 2 1/2 weeks, the retina seemed reattached, but, immediately after her leaving the bed, became again detached. Within three months the detachment had as usually settled downward.

At the next examination, 1 1/2 years later, the retina was reattached all over and the former rupture could not be detected. There was one larger immovable opacity of the vitreous and a few very small floating ones. The patient related that she had run against a tree with the right side of her forehead and sustained such a severe contusion that she fell down, bleeding from forehead and occiput. The sight of the right eye then steadily improved with full recovery within three months. Probably the contusion caused a rupture of the detached retina and admitted the subretinal effusion into the vitreous. This pressed the retina against the chorioid to which it became agglutinated by hemorrhages into the subretinal space. C. Z.

CONCERNING RETINAL DETACHMENT.—V. HIPPEL, E., Heidelberg (*Graefe's Arch.*, lxviii, H. I, April 3, 1908), reviews critically the theories held concerning the production of retinal detachment and claims that a fibrillar degeneration of the vitreous body in the sense attached to it by Greeff is not asserted by Leber, Nordensen and Gonin. "A condensation of fibrillar character may be presented in the microscopic picture of the elements of the vitreous structure by a marked degree of constriction. This is possible: (a) in consequence of hardening (an artifact); (b) the result of compression (e. g., in chorioidal and extraocular tumors); (c) as a vital shrinking of the vitreous body.

He reasserts that the retraction theory as promulgated by Leber of a gradual retraction of the vitreous body together with the retina must be considered possible and further, that not only the shrinking of the vitreous but also the new formed tissue elements springing from without the retina itself claim attention.

From his observation in a previously reported case he is of the opinion that an exudation theory is neither likely or necessary.

He gives the histological findings in a case where there was likely a spontaneous detachment of the retina in a highly myopic eye with posterior staphyloma. The vitreous body showed no pro-

nounced condensation nor fibrilla character. It was in greater part fluid, but on the other hand it could be asserted that the portion of the vitreous remaining was saturated with the same coagulated fluid as filled the rest of the eye. A traction of the vitreous upon the retina could not be said to have occurred. The chorioid was detached and the firm connection between it and the retina made possible the conveyance of the pull to the chorioid but with the flocculent condition of the vitreous this could not have occurred. Certainly in this case the theory of the shrinkage of the vitreous will not apply.

In a second case in which the beginning was a hemorrhage the residue of which was presented by strong pigmentation beneath the retina in the anterior portion of the vitreous, the retina was thrown into long convolutions. Whether an observed preretinal delicate strand was of cellular formation or thickened vitreous could not be determined anatomically. There was a funnel-shaped detachment and on the walls of the funnel opening and in the anterior portion of the funnel there was a coherent mass and a high degree of concentration of the vitreous which was also stretched across the mouth of the funnel. The compact quality which it possessed in most parts and the fact that it stained deeply with v. Giessen's stain pointed to its not being an artifact. While he could not assert that the thickened coherent vitreous membrane represented the entire vitreous structure yet, if, for example, a portion was dissolved and the remainder was shrunken into a mass, it could act as a tractor. If the described findings could not be attributed to an exudate from the chorioid which elevated the retina, it explains the ruffled folds which the anterior portion of the retina showed on its under surface. While Greeff believes that cicatricial bands could not produce a funnel detachment of the retina and that this could only follow from an elastic distention from without, the author believes that an exudate from without would give an appearance to the retina similar to a filled sail and through gradual pressure upon the vitreous possibly come to flatly overlie the posterior surface of the lens, the zonule and the pars ciliaris retina, the latter with difficulty becoming detached. This is what is found in tumors of the chorioid in the non-inflammatory stage. Should, however, the detachment be produced by the contraction of tissue connected with the inner surface of the retina with a retraction of the latter, a reefed sail effect with innumerable folds would result and this is exactly the findings in almost all cases of spontaneous partial detachments. Whereas in detachment from chorioidal tumors the pars optica is seldom

detached and when so it forms a band continuous with the detached retina without elevations or depressions, the surface of the retina being always smooth; in spontaneous detachment the pars ciliaris is often detached in a relatively early stage, and one finds regularly in certain places, particularly near a rent, the ruffed condition of the retina with occasional union of the parts which come in contact on their inner surface. W. Z.

RETINITIS ALBUMINURICA.—SCHICK (*Wiener Medizinische Wochenschrift*, March 14, 1908). The examination of two cases of albuminuric retinitis convinced the author that the characteristic changes in the retina are not caused by the diseased condition of the bloodvessels.

One patient was suffering from parenchymatous nephritis which terminated fatally in a comparatively short time. The autopsy showed no traces of changes in the bloodvessels. In both cases there were found severe changes in the nervous elements of the retina. The author gives his opinion, that these changes were caused by toxic influences and not by changes in the bloodvessels. The sclerotic process in the retinal bloodvessels, by the diminished nutrition of the tissues, accelerates the intoxication of the nervous elements. J. G.

REFRACTION AND ACCOMMODATION.

A MONOCULAR METHOD OF CORRECTION OF AMETROPIA.—DUNN, PERCY, London (*Ophthalmoscope*, February, 1908). Instead of bifocal lenses for presbyopes who have ametropia he sometimes prescribes the ametropic correction for one eye and the ametropic correction plus the presbyopic correction for the other eye. The patient is then enabled to read with one eye and see at distance with the other. The author claims that these lenses do not cause discomfort nor confusion, as do bifocals. M. B.

CASE OF PARALYSIS OF THE ACCOMMODATION.—STUART, C. C., Cleveland (*Cleveland Med. Jour.*, January 1908), reports this condition associated with iridoplegia, of specific origin, in a married man of 30, coming on ten years after the initial lesion. Acquired syphilis and diphtheria are the two commonest causes of this affection. Hereditary lues, typhoid, mumps, measles, scarlatina and whooping cough are occasional etiological factors. It would be well to examine the amplitude of accommodation of all patients as a routine measure, as a paralysis or paresis may be the explanation of a number of cases which require much stronger lenses for near work than their age would indicate. P. H. F.

SYMPLECTIC PARALYSIS OF ACCOMMODATION.—EMERSON, LILL, Orange, N. J. (*Ophthalmic Record*, March, 1908). Complete paralysis of accommodation without involvement of the sphincter iris occurred in a man who had undergone two years' treatment for syphilis contracted three years previously. Full doses of iodid and mercury resulted in a complete return of the accommodative power in five weeks.

M. B.

SCLERA.

POSTERIOR SCLERITIS AND INFARCTION OF THE POSTERIOR CILIARY ARTERIES.—COATS, GEORGE, London (*Ophthalmological Society's Transactions*, vol. xxvii), refers to two unusual forms of deep-seated scleritis—the so-called “brawny infiltration of the sclera,” or annular scleritis, and posterior scleritis. The author knows of no case of the latter variety that has been reported in English literature and states that only two cases have been submitted to pathological examination.

He refers to cases reported by Fuchs, Knapp, Wagenmann, Salzer, Gayet and Coppez. The author gives the clinical and pathological report of a case in which the eye showed the clinical symptoms of a chronic iridocyclitis. Microscopical examination showed, in addition to the signs of an iridocyclitis, a general slight retinitis with cellular infiltration of the posterior, as well as of the anterior, part of the vitreous, and an area, above the papilla, in which the sclera, chorioid and retina showed moderate inflammatory infiltration and extensive necrosis. The author thinks the iridocyclitis was a result of the disease at the posterior pole. The extent of the necrosis was out of all proportion to the amount of inflammatory infiltration and Coats believes that this points to the local action of some powerful toxin, or to the cutting off of the blood supply, or to a combination of the two factors, and favors the second supposition, that the blood supply was cut off by the blockage of one of the larger ciliary arteries. He explains the slight inflammation in the tissues around the necrotic area as due to toxic bodies of low virulence originating in the necrotic tissue. He believes that similar toxic bodies were also diffused into the vitreous and set up an inflammation in the iris, ciliary body and retina.

W. R. M.

SINUSES, NOSE AND THROAT.

THE APPLIED TOPOGRAPHICAL ANATOMY OF THE SINUSES ACCESSORY TO THE NASAL CAVITIES IN THEIR RELATIONS TO THE ORBIT AND ITS MORE IMPORTANT CONTENTS.—EVANS, J. HOWELL, London (*Ophthalmoscope*, April, 1908). Does not lend itself well to abstract. M. B.

THE OCULAR AND ORBITAL COMPLICATIONS OF DISEASE OF THE ACCESSORY NASAL SINUSES.—EVANS, J. J., Birmingham (*Ophthalmoscope*, April, 1908). Four cases are reported of optic complications from antral disease. One was a purulent dacryocystitis; one an orbital cellulitis affecting the optic nerve; one an orbital cellulitis in a baby eight weeks old, with some optic atrophy resulting, and another a case of optic neuritis without other inflammatory changes in the orbit. Frontal sinusitis usually causes no definite ocular affection beyond displacement of the globe, headache and asthenopia. A case is reported of a growth in the region of the frontal and ethmoidal cells associated with a lesion of the optic nerve. Diseases of the ethmoidal cells cause more varied complications of the orbit and its contents than any other of the accessory nasal sinuses. A case is reported of orbital phlegmon, one of mucocele, another of phlegmon in a 2 year old child with destruction of the eye, another of poor vision with restricted fields which improved when posterior ethmoidal cells were operated upon, another was a case of exophthalmos with iridocyclitis which got better after a discharge of pus from the nose, and lastly a case of temporal contraction of both fields from suppurative ethmoiditis. One case of disease of sphenoidal suppuration is reported with bitemporal hemianopsia. The posterior ethmoidal cells were also involved in this case. M. B.

OPTIC NEURITIS DUE TO CHRONIC EMPYEMA OF THE FRONTAL AND ANTERIOR ETHMOIDAL SINUSES.—MURRAY, WM. R., Minneapolis (*Ophthalmic Record*, April, 1908.) A farmer aged 35 years, suffering from intense headache, dizziness, nausea, vomiting, gastric and intestinal disturbances extending over a period of one year, was found to have suppurating frontal, anterior ethmoid and maxillary sinusitis on right side. O.D.V. = 20/C., optic neuritis, visual field contracted for white and colors, with a small central relative scotoma. The anterior half of a large and edematous middle turbinate was removed, a permanent opening made into antrum after resecting the anterior portion of the inferior turbinate and later a modified Killian operation was performed upon the frontal and anterior ethmoidal cells. Fourteen days after the last operation the vision was normal. M. B.

THE FREQUENCY OF ORBITAL MANIFESTATIONS OF NASAL SINUSITIS.—THOMPSON, ST. CLAIR. London (*Ophthalmoscope*, April, 1908), believes that diseases of the accessory sinuses of the nose are a frequent, if not the most frequent, cause of inflammatory affections of the orbit. While most sinus cases are attended with nasal suppuration, some cause no discharge. He reports five cases which illustrate how orbital symptoms may depend upon sinusitis, and how trifling the nasal symptoms may be. Many patients make no complaint of a trifling nasal discharge or even deny its existence, while others may present no nasal suppuration. We should cease to regard orbital cellulitis as a primary affection, but should look to the nose and its accessory sinuses for the source of infection. M. B.

THE RELATIONS OF THE INFLAMMATORY ORBITAL AFFECTIONS TO DISEASES OF THE ACCESSORY SINUS OF THE NOSE.—BIRCH-HIRSCHFELD, A., Leipzig (*Klinische Monatsblætter fuer Augenheilkunde*, January, 1908, xlv, I, p. 1), gives a critical review of the incident literature on 684 cases of orbital inflammations, including 40 observed by himself at the eye clinic in the University of Leipzig. Four hundred and nine of these, i. e., 59.8 per cent., were caused by inflammation of the sinus, viz., of the frontal 129 cases (29.8 per cent.), maxillary 89 (21.8 per cent.), ethmoidal 83 (20.5 per cent.), sphenoidal 25 (6.1 per cent.). In 60 cases (14.7 per cent.) several sinus were diseased, most frequently (25 times) the frontal and ethmoidal sinus, 12 times ethmoidal and maxillary, 10 times ethmoidal and sphenoidal sinus. In almost all cases the affection consisted in chronic or acute purulent sinusitis, due to rhinitis, influenza, pneumonia, scarlet fever, diphtheria or traumatism.

With regard to the propagation of the disease to the orbit, the author accepts, for the majority of cases, the explanation given by Kuhnt for the frontal sinus: through the purulent affection of the mucous membrane of the sinus the bone, separating it from the orbit, becomes diseased, especially where the periosteum is thin or at the foramina for the blood vessels. Or the transmission occurs through dehiscences of the bone or through thrombophlebitis or periphlebitis, followed by periostitis of the orbit, orbital abscess and phlegmon.

For the diagnosis of the origin of the orbital affection the rhinoscopic examination, circumscribed pain on pressure, the pain on ocular movements, on pushing the eyeball back, displacement of the globe, fluctuation, fistulæ and especially the affection of the optic nerve, are of great importance.

Birch-Hirschfeld considers the central color test of much greater value than the peripheral contraction of the visual field. Eight cases are mentioned from literature in which central unilateral relative or absolute scotomata led to the diagnosis of inflammation of the sphenoidal or posterior ethmoidal cells, and in three of his own cases within the last two years a central scotoma for red and green was found in cases of inflammation of the posterior sinus which were verified by the operation.

Not unfrequently blindness ensues. Out of 89 cases this was due to empyema of the maxillary sinus in 24 (27.2 per cent.), of the frontal sinus in 6, and the ethmoidal sinus in 13. Ophthalmoscopically hyperemia of the disc, optic neuritis and atrophy, thrombophlebitis of the retinal veins, hemorrhages and detachment of the retina were observed. In 18 out of 409 cases corneal ulcers, in 8 panophthalmitis, in 2 glaucoma were ascertained. The high percentage of blindness from empyema of the maxillary sinus was perhaps due to thrombophlebitis, which was frequently encountered in B.'s statistics (13.5 per cent.).

Fifty-two out of the 409 cases (12.7 per cent.) were fatal, from empyema of the sphenoidal sinus 28 per cent., of the frontal 16.3 per cent., sphenoidal 14.6 per cent., ethmoidal 6 per cent., of more than one sinus 11.6 per cent. The average mortality was less than in genuine orbital inflammations (17 per cent.). The author explains this by the favorable effect of the treatment of the empyema of the sinus and from the lesser frequency of thrombophlebitis after sinusitis than in genuine inflammations. The postmortem examinations revealed meningitis 34, frontal abscess 15, sinus thrombosis 6, pneumonia 4, sepsis 2.

For the treatment of orbital suppurations Birch-Hirschfeld recommends large incision at the orbital margin and detachment of the periosteum from the orbital wall, in order to gain a broad access to the point of perforation, under careful preservation of the contents of the orbit, and free drainage. C. Z.

OCULAR SYMPTOMS AND DISEASES ACCOMPANYING ADENOIDS.—MAY, CHARLES H., New York (*Arch. of Pediatrics*, January, 1908). A certain number of ocular symptoms and diseases occur with sufficient frequency in children who have adenoids, to warrant the assumption of a relationship between the nasopharyngeal and the ocular conditions. These anomalies consist of epiphora, blepharitis, catarrhal, and more rarely purulent, dacryocystitis, congestion of the conjunctiva, phlyctenular conjunctivitis and keratitis, subacute and chronic conjunctivitis, certain forms of con-

conjunctivitis bordering on the trachoma type, and true trachoma. None of these ocular symptoms and affections can be properly considered as due entirely to the existence of adenoids, since they are all found in children who are free from the latter; but they frequently accompany the adenoids; the existence of the nasopharyngeal condition aggravates the ocular anomaly, and the removal of the adenoids causes a disappearance of the ocular affection in some cases, and in others makes the cure less difficult.

The adenoids should be regarded as a predisposing factor rather than as a direct cause. If we stop to consider the congestion of the nasal mucous membrane and the consequent catarrhal inflammation of this membrane produced by the adenoids, we will readily understand how, in the same manner, the neighboring conjunctiva will become congested and be disposed to catarrhal inflammation. Not only is there apt to be congestion, but the catarrhal inflammation travels up to the lacrimal duct and thus infects the conjunctiva by contiguity.

Epiphora, or excessive lacrimation, is frequently seen in children affected with this condition, and very often without any change in the conjunctiva or in the lacrimal sac or duct except congestion. Such epiphora is not infrequently an annoying symptom in infants, and where there is an absence of visible change in the conjunctiva, and the lacrimal sac seems normal, adenoids should be thought of. The blepharitis, catarrhal conjunctivitis, dacryocystitis, and the phlyctenular affections can be explained in the same manner—the local predisposition is produced by the congested conjunctiva. There is one form of conjunctivitis which is particularly prevalent in children affected with adenoids; this is the variety about which at present there is a great deal of controversy as to whether such cases are instances of real trachoma, or are examples of subacute conjunctivitis with follicular hypertrophy.

C. H. M.

IRITIS DUE TO DISEASES OF THE SINUSES.—MASON, F. G., Mason City (*Iowa Med. Jour.*, Dec. 15, 1907), reports two cases, both in a desperate condition. One had had an eye enucleated, the other was blind from occluded pupil with secondary glaucoma. In the first case, that of a man of 58, iritis had come on periodically for seven years. Iridectomy was done to relieve tension, and the anterior portion of the middle turbinal was resected. There was a mucus discharge from the sinuses and the inflammation of the eye began to subside immediately. Later, the lens was removed, and a second iridectomy made to improve vision. The uveitis of long standing left considerable exudate which

greatly impaired vision. In the second case, surgical treatment of the obstruction to sinus drainage was followed by a cure of long standing iridocyclitis.

Headache, lachrimation, disease of the lids, neuralgia, vertigo, and muscle imbalance are frequently aggravated by, and often the result of, sinus disease. The ocular disturbance in such cases is frequently more pronounced in the morning, and apt to be unilateral. Usually no complaint is made of the nasal condition, and a thorough rhinological examination should be made in all obscure cases.

P. H. F.

PELEGMON OF THE ORBIT WITH OPTIC ATROPHY CONSECUTIVE TO A MAXILLARY SINUSITIS AND PROVOKING A SYMPATHETIC OPHTHALMIA.—TEILLAIS (*Annales d'Oculistique*, July, 1907). There was sinusitis of the left maxillary antrum extending to polysinusitis of the left side with sudden blindness and optic atrophy of the left eye. Notwithstanding that the right sinuses were free from disease there was neuroretinitis with diminution of vision of the right eye. Vision was lost in the left eye three weeks after the appearance of the orbital abscess, and a month later the right eye was involved.

The author thinks it cannot be doubted that the affection of the right eye was sympathetic, but, as a rhinologist reported that the sphenoidal sinus was involved in the suppuration, it seems not improbable that this was the cause of the neuritis.

G. C. H.

TOXICOLOGY.

A CASE OF BELLADONNA POISONING.—EEBERHART, W., Michigan City, Ind. (*Ophthalmic Record*, January, 1908). Two homatropin-cocain discs were used in each eye of a girl 12 years of age within an hour, but did not produce full mydriasis nor constitutional symptoms. A few days later a 4-grain sol. atropin was used in each eye four times within an hour and then supplemented by a homatropin disc in each eye without full mydriasis. After going home the girl became delirious and had all the symptoms of atropin poisoning. Recovery followed the use of pilocarpin and morphin.

M. B.

INVESTIGATIONS INTO THE EFFECTS OF TOXINS UPON THE CONJUNCTIVA OF ANIMALS THROUGH ENDOGENOUS ROUTES.—TSCHIRKOWSKY (*Graefe's Arch.*, lxxviii, 1, April, 1908), states that his experiments failed to prove conclusively that the dysentery toxin per viam internam was capable of producing an endogenous toxic conjunctivitis in the true meaning of the words,

but that a step forward was made in determining that an ocular secretory phenomenon can be excited in toxemic animals through endogenous toxic influences. This consisted in the production of a marked increase in the secretion of tears which was undoubtedly due to the endogenous toxic irritation of the secretory elements. It is still to be determined in how far the conjunctiva itself would be affected in animals deprived of their lacrimal glands. W. Z.

A CONTRIBUTION TO THE QUESTION OF THE ACTION OF TOXINS UPON THE CONJUNCTIVA.—TSCIIIRKOWSKY, Kasan (*Graefe's Arch.*, lxxviii, H. 1, April, 1908). After reviewing the work of previous investigators and detailing his own experiments, Tschirkowsky concludes that, contrary to the opinion of Randolph, the continued instillation of various types of bacterial substances, especially the products of metabolism, may serve to demonstrate an inflammatory toxic excitor, and that one of these toxin products has exhibited advantages for the method of subconjunctival injections. By the protracted instillation of toxic substances these are probably absorbed by the conjunctiva whereby it seems probable that the toxins in certain quantities and concentrations can produce a separation of intact epithelium, as is shown by the investigations, particularly with reference to diphtheria toxins, of Copey, Morax Elmassian and Romer. On the other hand, it is possible that the chemical substances contained in the culture filtrate and in the dead cultures excite the necrosis of the epithelium and thus favor the absorption by the conjunctiva of the toxins. Lesions of the epithelium are known to form a favorable condition for the absorption of toxins. From the investigations of the irritating substances of various microbes it is shown that without doubt the diphtheria toxin excites a specific conjunctivitis. A certain typical period of incubation before the action of the toxin, the characteristic changes in the conjunctiva, the absence of effect if the toxin is brought to 100°C., the completely negative results from the continued instillation of the toxin into the conjunctival sac of immunized rabbits, all speak for the true toxic nature of this form of conjunctivitis. As to the other group of bacterial substances, the effects on the conjunctiva are not such as to be characterized as a specific conjunctivitis. No typical period of incubation is noticed, it is more or less the same for all of these poisons. Heating to 100°C. does not set aside the irritating action entirely, as is the case with diphtheria toxin. The action of these substances is less uniform, as the microbes in question do not as a whole form toxins as do the diphtheritic organisms. The question of an endotoxin is in question. This much

is certain, that one can by the protracted instillation of the toxic substances of this class produce a conjunctivitis. The author observed no marked changes of bacteria containing conjunctival sac of animals under the influence of toxins, although it is not impossible that the injury to tissue resistance by the introduction of toxins, in certain cases, as Valenti claims, may produce a change in the pathogenic peculiarities of the usual inhabitants of the conjunctiva.

While the author considers it impossible in the present stage of our knowledge to differentiate the rôle played by each individual toxin in the pathology of conjunctivitis, he believes that his observations prove the undoubted and prominent significance of the part played by the products of metabolism of the microbes in the inflammatory processes of the conjunctiva. W. Z.

ON LEAD POISONING WITH EYE AFFECTIONS.—WIRSING, DR., Berlin (*Deutsche Medizinische Wochenschrift*, 1907, No. 45, p. 1854). A woman, aged 30, took for an indigestion, instead of bicarbonate of soda, a teaspoonful of red lead oxid with some water. After about two weeks, symptoms of lead intoxication developed: colic, headache, tinnitus, palpitations of the heart, dyspnea, profuse perspiration, vomiting, vertigo. About two months after the accident her memory failed and visual disturbances set in with diplopia and micropsia. Then she became drowsy and could not recognize anybody so that she had to be brought to the hospital.

The examination of the eyes by Dr. Helbron, six weeks after admission to the hospital, revealed: V. R. = $5/v$, V. L. = $5/vi$. Left mydriasis, reaction of both pupils sluggish, paresis of left superior oblique, contraction of left visual field from 15° to 20° , color perception normal, optic neuritis, with commencing atrophy in left eye. Under pilocarpin-instillations, warm baths and iodid of potassium a rapid improvement took place of the general and eye symptoms, and the paresis of the left trochlearis was perfectly cured.

In the now following synopsis of literature on eye symptoms in lead poisoning, Wirsing emphasizes the great discrepancy of authors as to their frequency. Lewin mentions 187 cases and says that amblyopia saturnina is a rather common occurrence among the working men in the lead mines of the Oberharz.

Amblyopia saturnina has been observed without any objective symptoms and is thus analogous to the anesthesia saturnina of the peripheral nerves; or it may be due to uremia, anemia of the retina from arterial spasms, or a symptom of incipient or com-

plate papillitis, neurorethinitis, commencing atrophy, occasionally simulating cerebral tumor. Hemianopsia, hemiachromatopsia, affections of the sympathetic nerve, with oculo-pupillary symptoms; narrowing of the palpebral fissure, spastic miosis of the ocular muscles in various combinations, as pupillary affections from paresis of the 3rd nerve, have been described. C. Z.

THE 'TOXIC AMBLYOPIAS: A CRITICAL STUDY, WITH REPORTS OF TWENTY-FOUR CASES.—STRICKER, LOUIS, Cincinnati (*The Lancet-Clinic*, May 2, 1908), reports 2 cases of blindness from the inhalation of wood alcohol, and says in all there are 17 cases reported. Wood and Buller have reported 153 cases of blindness and 122 cases of death from drinking wood alcohol. They also reported 3 cases of blindness from rubbing wood alcohol on the body. A recent examination of toilet articles shows a long list of hair tonics, which the writer names, in which wood alcohol was used. The writer has, in tobacco and alcohol amblyopia, contrary to the findings of Uthoff, found a decided narrowing of the color fields or total loss of color sense. Mechanical interference with the entrance or exit of blood from the eye, or arteriosclerosis following alcoholism, excessive use of tobacco or lead poisoning, may interfere with the nutrition of the retina, and explain the contraction of the color fields. In most cases, ophthalmoscopically, the picture is negative, occasionally there is a slight hyperemia of the temporal side of the disc or rarely pronounced optic neuritis with flaming hemorrhages in the retina. He believes "that the uncomplicated toxic amblyopias ought to be considered as retinal diseases." After discussing in detail the action of poisons on the nerve elements he says: "As a general proposition, one might say intense poisons produce sudden death of the ganglion cells, atrophy and death of the axis cylinders, and there is no restitution. Chronic poisoning first induces death of the axis cylinders; here prompt interference will arrest the process, and in all probability lead to a subsequent regeneration of the axis cylinders; but where the poison has acted for a long time the ganglion cells die, after which there can be no possible restitution of the axis cylinders." The writer emphasizes the physico-chemical side of this question, and directs attention to the experimental study of Dr. Reid Hunt. He believes that methyl alcohol acts especially on the most highly differentiated nerve structures. From experiments of Dr. Schweinitz and others, it is believed that the methyl alcohol is changed into an aldehyde, then into formaldehyde, which is rapidly changed into formic acid within the body. It is shown by Dr. Hunt that the physiological process of methyl

olism in the cell of a moderate drinker is changed; that instead of inhibiting oxidation, alcohol increases this power of oxidation, so that substances, which in the case of an abstainer would remain harmless, in the alcoholic are rapidly oxidized and may produce substances which act as a poison to the cells. This may explain these cases of sudden developed amblyopias in individuals who have practically been moderate drinkers all their lives, and in whom no sudden excess can be called upon to explain this sudden attack. "Is it not possible that food products which undergo decomposition (ptomains and leucomains) in the intestinal tract, or even products absorbed, may become toxic in an alcoholic owing to the increased power of the cells to split up the molecule, and thus produce substances which produce blindness and death?"

M. D. S.

TOXIC AMBLYOPIA FROM WOOD ALCOHOL.—CARILART, W. M., New York City (*American Medicine*, April, 1908). C. S., aged 23, a painter by trade, came with a history of being blind in both eyes for twenty-four hours. He had been working the past three weeks in shellacking the interior of beer vats. For three days previous he had had attacks of nausea and vomiting. The vessels of both fundi were markedly engorged, both optic discs obscured by a swelling of their substances, greater above and below than laterally, the right eye being the worst. After free diaphoresis and catharsis were produced, iodid of potash and strychnin were used in increasing doses. In the left eye vision increased to 3/cc, in the right to perception of shadows, the appearance in each eye being that of partial optic atrophy. The engorgement and swelling of the discs gradually disappeared. The close confinement of the air in the vats was the apparent cause. The picture was such as may be caused by taking wood alcohol in bulk, but this occurred only from the inhalation of the fumes.

M. D. S.

UPON A DANGER IN MEDICATION BY ATONYL AND THE CARE NECESSARY AS TO ITS USE.—HALLOPEAU (*La Clinique Ophtalmologique*, October 25, 1907). The author refers to a communication which he made to the French Academy of Medicine June 4 last, calling attention to dangers of anilido-arsenical medication in large doses and indicating the conditions in which this might be otherwise completely avoided by lessened doses. Hallopeau refers to a case related by an eminent practitioner, of a woman 47 years old, who had alcohol neuritis and was given 5.10 grams of atoxyl by intramuscular injection; a few days later failure of vision was noticed and in 14 days amaurosis followed. It is quite

likely that the atoxyl was the cause of the blindness; at the same time the subnormal condition of the patient should be considered, she having had alcohol neuritis which brought a *locus minoris resistentiæ* to the action of the medicine. Then the large doses and also that the atoxyl (one of foreign make) contained free arsenates and arsenites, should be taken into consideration.

Hallopeau's personal observation is that out of 139 cases treated at the Saint Louis Hospital with French atoxyl, no visual trouble occurred. In a dozen patients treated by Hallopeau with a foreign make of atoxyl two experienced difficulty, but it was transient, showing that the foreign product was different from the French make. The author refers to other cases in which amaurosis supervened after a continuous medication with atoxyl for three months. And yet atoxyl is employed in the treatment of the sleeping sickness, at times in enormous doses, 55 grams being given in a few weeks, and lately the drug has been recommended as a prophylactic for that disease. Kopke of Lisbon has seen 14 patients treated by atoxyl; in 6 of them visual troubles were produced, and in 3 of these blindness followed. Gama Pinto found optic nerve atrophy in two; in another case he found unilateral hemianopsia; the smallest dose had been 5.50 grams. Hallopeau's method, which he considers safe, is to give decreasing doses of the French atoxyl, the first 0.75 gram, two days later 0.60 gram and three days later 0.50 gram. B. E. F.

TRACHOMA.

THE TREATMENT OF TRACHOMA.—VEASEY, C. A., Philadelphia (*Therap. Gaz.*, January, 1908). Argyrol solution for cleansing. Remove trachoma granules by expression and follow immediately with 1 to 500 bichlorid. The after treatment should consist of applications of solutions of copper sulphate. He has found the Roentgen rays and jequirity of no special value. He thinks the U. S. government should exercise more judgment in excluding trachomatous individuals from this country. The stage of the disease, the financial condition of the patient or the patient's relatives, the prospect of the patient never becoming a public burden should be considered in interpreting the law. M. B.

TRACHOMA.—HEATH, F. C., Indianapolis (*Indiana Med. Jour.*, xxvi, No. 6), refers to the necessity of careful eye examinations not only in ports of entry but in all localities where immigrants are employed in large numbers. Early treatment is of importance, and trachoma, as a rule, requires care for a considerable period of time. Expression by Knapp's roller forceps, applications of

copper sulphate in substance, strong solutions of argyrol or weaker ones of silver nitrate, hot or cold applications, are valuable in the early stages, while later on, prolonged treatment and various operative procedures may be required.

P. H. F.

TREATMENT OF CHRONIC TRACHOMA.—PRINCE, A. E., Springfield, Ill. (*Jour. A. M. A.*, April 25, 1908), has had excellent results with a $\frac{1}{2}$ per cent. solution of copper sulphate in glycerin to be used frequently by the patient at home, and gradually increased in strength to the limit of toleration. Two other favorite remedies are glycerole of tannin, 4 per cent., and yellow oxid of mercury, $1\frac{1}{2}$ per cent., which are almost universally tolerated. Silver once a day, $\frac{1}{2}$ per cent., is excellent in the presence of muco-purulent secretion. The operation of expression with scarification and milking out the follicles, is necessary in a large proportion of cases. Ten per cent. copper sulphate in glycerin is then scrubbed into the lids with cotton. After-treatment is of paramount importance, and too much reliance should not be placed on the mere operation. Jequirity, which was generally abandoned after having been taken up with undue enthusiasm and used promiscuously, is recommended for cautious use in selected cases. The infusion should be made from freshly prepared powder, the beans being deprived of the cortex by grinding in a hand pepper-mill and a solution of not more than $\frac{1}{4}$ per cent. used at first. This may gradually be increased to $\frac{1}{2}$ per cent. or 1 per cent. at most. Excision of the tarsus is of value in case of deformity, cysts, irregular cicatrization or marked roughness, trachomatous foci in the depths, or granular deposits which cause recurrent inflammation.

P. H. F.

TRACHOMA; CLINICAL ASPECTS AND SUCCESSFUL TREATMENT.—EGBERT, J. HOBART, Willimantic, Conn. (*N. Y. Med. Jour.*, March 21, 1908). The writer mentions the various methods of treating trachoma, and deprecates the employment of the most common one—sulphate of copper. He alludes to the use of 1:500 bichlorid of mercury rubbed into the conjunctiva as more or less satisfactory, but he believes that the manipulation and not the medication is the important factor in the procedure, since he has obtained good results from massage of the tissue of the lids with a smooth glass spatula.

Previous to this treatment, however, most cases require operation for the opening and emptying of all granules and the removal of hyperplastic material. For accomplishing this he uses a sharp and blunt curette so constructed that all portions of the

conjunctiva can be reached with little danger of injuring smooth healthy tissue. When done thoroughly the operation will seldom require repetition, though stimulation through rubbing with the blunt instrument is frequently called for at intervals to promote resolution in the diseased area. This rubbing and massage may often, however, be advantageously carried out by means of the glass spatula.

C. H. M.

THE USE OF JEQUIRITY IN TRACHOMA.—GILLMAN, ROBERT WINTHROP, Detroit (*Jour. Ophth. and Oto-Laryng.*, March, 1908, ii, 85), advocates the use of jequirity in the treatment of trachoma, and, in selected cases, believes that it gives better results than any other method of treatment for trachoma. He states that the typical cases calling for the use of jequirity are eyes partially or completely blind from pannus or vascular keratitis following or complicating trachomatous granulations on the palpebral conjunctiva. The author also uses it in chronic cases without corneal involvement which do not improve under milder remedies. He starts treatment with the infusion, 2 per cent. solution, and later uses the powder if the case requires it. He cites clinical cases illustrating the rapid and satisfactory improvement following its use.

W. R. M.

TUMORS.

DERMOID OF THE LOWER LID.—CALDERARO, PAULINO (*La Clinica Oculistica*, January, 1908). A patient, 52 years old, at the age of 8 years was carried to a physician for a small tumor which had shown itself two years before and had increased gradually in size. It was situated on the left lower lid on the external half near the ciliary margin. The physician proposed excision but his advice was not taken. Up to the age of 18 years the tumor was the size of a small chick-pea; it then began to grow and increased in size for ten years. The tumor was as large as a pigeon egg, had the color of the skin and was attached to the lower lid. After removal in toto it was semi-transparent, yellow in its upper half; from its lower part was removed with a Pravaz syringe about eight drops of a yellow, oily liquid which under the microscope showed some epidermoid cells in suspension, infiltrated with pigment granules and crystals of cholesterolin. Microscopically the wall of the cyst was made up of epithelium and connective tissue which represented the dermic chorion. Capillary vessels were wanting but large veins and small arterial trunks were abundant. In that part of the eyel corresponding to

the anterior and superior portions, that is to say, in the part most exposed to trauma, there was an intense small cell infiltration which in the form of foci and cordons with their various anastomoses constituted an inflamed halo of several millimeters. The cyst presented neither glands nor hairs. The cutaneous covering preserved all its attributes and presented no alterations save a slight thickening of the dermic connective tissue and a scarcity of the fibers of the orbicularis. The epithelium covering the dermoid was made up of cuboid elements in six to ten layers.

R. H. J.

PRIMITIVE TUMOR OF THE PALPEBRAL CONJUNCTIVA AND TUMOR OF THE CORNEA.—AUBINEAU (*Annales d'Oculistique*, February, 1908). A married woman, 53 years old, in good health, noticed early in 1904 that the right upper eyelid was becoming thick and heavy, and at the end of 1905 its enlargement was so great as to prevent the opening of the eye. When she was seen in July, 1905, there was a firm, well limited, mobile tumor situated on the inner surface of the upper lid near the upper border of the tarsus. No pain and no enlarged ganglia. The tumor was covered by conjunctiva except in a horizontal zone where the neoplastic tissue was exposed.

There was also a grayish tumor occupying the upper part of the cornea about the size and shape of a kidney bean and corresponding in position to the uncovered part of the palpebral growth.

Both tumors were removed and in January, 1908, there had been no recurrence.

After microscopic examination, the author refers the tumors to the class designated as "endothelioma," whose characteristic is to be essentially polymorphic; sometimes appearing like an epithelioma and sometimes like a sarcoma. These endotheliomas present notable differences in point of malignancy. Some have all the characters of malignant tumors—generalization, recurrence and ganglionic involvement—while others show a tendency to assume an encysted form of a mildly malignant character.

G. C. H.

SYMMETRICAL ANGIOMATA OF THE SUPERIOR TARSALE CONJUNCTIVAE.—L'ANCONA, Milan (*La Clinica Oculistica*, January, 1908). A child, 2 years old, had a small red body behind the lid partly covering the right cornea and visible when the eyes were opened. Pain was apparently not present; there had been no hemorrhage. A more careful examination showed the presence of a small swelling between lid and cornea. On raising the lid one

could see a tumor as large as a big blackberry, of a red wine color, smooth surface, soft, elastic consistence, non-reducible by pressure, sessile, implanted by a 2 or 3 mm. base from the tarsal conjunctiva to the superior fornix. The O. S. at superficial glance appeared normal but on raising the lid the same character of tumor, smaller, was seen at the same place with surface slightly uneven. Both tumors were removed with a bistoury after tying off the bases. Hemorrhage was controlled by pressure. Under the microscope sections showed blood vessels dilated and some new formed, others joined to form large cavities. Between the vessels were trabeculae of connective tissue. The diagnosis was cavernous angiomata of the conjunctivae. R. H. J.

PAPILLOMA OF THE CONJUNCTIVA WITH REPORT OF A CASE SUCCESSFULLY TREATED WITH X-RAY.—FATH, PHOS., Chicago (*Jour. Ophthalm. and Oto-Laryng.*, April, 1908, n. 130), reports a case of papilloma of the conjunctiva occurring in a man aged 28. The case had been treated for trachoma and the conjunctiva of both upper and lower lids had been curetted four times during the previous six years. Microscopical examination showed the growth to be a papilloma. The case was put on x-ray treatments, beginning with exposures of six to ten minutes' duration three times a week, without everting the lids. Later treatments were less frequent and at the end of four months the conjunctiva was smooth and free from growths. Three years later there was no return of the growth. The author refers to published cases and adds a bibliography. W. R. M.

A CASE OF RETROBULBAR TERATOID TUMOR (KROENTZIN'S OPERATION).—ROTHSCHILD, OTTO, Frankfurt a. M. (*Deutsche Medizinische Wochenschrift*, 1907, No. 49, p. 2048). The diagnosis of retrobulbar tumor of the right eye of a man, aged 28, was made from the following condition: The lids were protruded but could be closed. The upper lid rested on the eyeball, the lower one was in its temporal third standing off from the eyeball, the nasal third was entropic. On pulling the lids apart, a round prominence appeared under the conjunctiva at the temporal angle, extending $\frac{1}{2}$ cm. over the orbital margin. It was circumscribed, hard, and could be pushed into the orbit. There was exophthalmus upward and toward the nose; no noticeable diplopia. The conjunctiva was hyperemic, the pupil of the same size as the other, reacted promptly. The right disc was a little redder than the left, V. = 5 viii, accommodation and visual field normal.

A retrobulbar teratoid tumor, of the size of a cherry, was removed by Kroenlein's operation from the temporal side of the eyeball, between periorbita and muscular funnel, with preservation of normal sight and motility. C. Z.

PROBABLE TUMOR OF THE PITUITARY BODY WITHOUT GIANTISM BUT EXHIBITING A BINASAL HEMIOPIA.—WOOD, CASEY A., Chicago (*Ophthalmic Record*, March, 1908). A woman of 39 years, in apparent good health, complained first of dimness of vision at near point with a sense of strain. Later she noticed that she could see better by turning her head to one side. She wore her hyperopia correction of 1.25 with some relief. Her vision is 1/x in O. D. and 1/v in O. S. Pupillary reaction and tension normal, shows a diffuse gray-white decoloration of both optic nerves. The fields of vision for white and colors show heteronymous hemiopia. A skiagram shows an enlargement of the sella tursica, with a faint shadow that represents an enlarged hypophysis. Her blood count shows red corpuscles 4,250,000; white corpuscles 9,600. She has no symptoms of acromegaly or myxedema. A month after the first examination she was examined again, when it was found that the visual fields and vision had improved. M. B.

SARCOMA OF THE ORBIT AND OF THE MIDDLE CEREBRAL FOSSA. HEMIANOPSIA AND HEMIOPIC PUPILLARY REACTION FROM COMPRESSION OF THE OPTIC TRACT.—MORAX (*Annales d'Oculistique*, October, 1907). A man aged 40 came under observation August 23, 1905, complaining of violent pain above the right orbit and in the right side of the head. There was decided irreducible exophthalmos, with partial limitation of upward and outward movements of the right eye. A diffuse swelling of the temporal region was noticeable. The eyes were healthy and the pupils acted normally. The headache commenced early in 1904. The patient had also subjective sensations of smell. He had been treated with intramuscular injections of calomel without relief. In January, 1906, there was noticed for the first time a slight swelling of the right optic disc, but there was no change in vision or field. Soon afterwards there was mental failure. In March there was vertigo, some difficulty in walking, left homonymous hemianopsia and hemiopic pupillary reaction. Unconsciousness and fecal incontinence followed and death occurred early in April.

The whole of the right temporal lobe of the brain was occupied by a sarcomatous tumor. There was also a tumor the size of a small walnut in the upper external part of the orbit connected with the intracranial tumor through the sphenoidal fissure. No

degeneration of the optic tract could be discovered with the microscope, though it was compressed by the tumor. G. C. H.

INTRACRANIAL METASTASES OF A GASTRIC CANCER AND COMPRESSION OF THE OCULOMOTOR NERVE.—ORINSKY AND KESS (Annales d'Oculistique, September, 1907). According to Galavardin and Varay it is probable that nearly all of the cases reported under the name of carcinoma of the brain are cases of cerebral generalization of visceral neoplasm. The numerous cases reported by these authors seem to justify this opinion, and emphasize the importance of clinical or postmortem examinations of the viscera of all patients affected with cerebral tumor. In certain cases these metastases appear as the first manifestations of latent visceral cancer.

The case reported was one of secondary intracranial localization of a pyloric epithelioma. Complete paralysis of the third nerve occurred rather suddenly and, after death, a cancerous growth was found in the cavernous sinus. G. C. H.

UVEAL TRACT.

PARACENTESIS OF THE ANTERIOR CHAMBER IN ENLARGED PROCESSES OF THE UVEAL TRACT.—DENIG, R., New York (*Ophthalmic Record*, March, 1908). During the past three years he has opened the anterior chamber at the limbus with a small keratome and allowed the aqueous to escape in 10 cases. Four were cases of interstitial keratitis, three of iritis, two of chorio-retinitis with vitreous opacities, one of post-operative cyclitis, and one of diabetic neuro-retinitis. The operation was followed in most cases by an improvement in the symptoms. M. B.

VISION AND COLOR VISION.

THREE CASES OF SERIOUS VISUAL DEFICIENCY AFFECTING RESPONSIBLE EMPLOYEES IN THE MARINE AND RAILWAY SERVICES.—GALLOWAY, A. RUDOLF, Aberdeen (*Ophthalmoscope*, March, 1908). Employees of the marine and railway services should have their eyes examined by medical men and not by lay members of the companies employing them. Several cases are reported in support of his contention. M. B.

RAILWAY ACCIDENTS AND THE COLOR SENSE.—STRATTON, G. M., Baltimore (*Popular Science Monthly*, March, 1908), notes that colored signals, as at present employed, must often be caught and translated into action instantly under conditions of uncommon mental stress. As proof of this strain he mentions that

engine crews of fast expresses have to lie off on alternate days. Even the normal eye is apt to confuse the colors at night in fog, smoke, or storm, at a great distance, or when burning low. The use of white is especially objectionable, as some window-lamp or other meaningless light along the course may be mistaken for a sign of safety. (Accidental breaking of the red glass in a danger signal would also cause it to read "safe" as long as the lamp was not extinguished. P. H. F.) Accidents due to such mistakes are on record. Green, when obscured by smoke, is with difficulty distinguished from white. As to red, the ruby glass in general use so diminishes intrinsic brilliancy that under adverse atmospheric conditions it may be impossible to recognize a danger signal at a distance compatible with safe railroading. Red of low intensity has little effect on the retina, as on the sensitive photographic plate. The color sense, altogether, is less dependable than the "rugged feeling" for place and direction, which is early given and pressed deep until it is a central fact in self preservation and advance.

The power to distinguish between rest and rapid movement of some conspicuous object would be the best to call upon in signaling. We are alive to slight quick movements in the field of view, and appeal is instinctively made to this deep and primal interest when the arms are waved or a lantern swung. Next to this, the simplest and least erring of our visual perceptions is of large differences like that between a vertical and a horizontal line, or one aslant. These rough and simple elements are precisely those used for the day signals of most block systems. This principle could be applied to night signalling with even greater success, as it would be possible to use some self-luminous line of light that would appear sharp and unmistakable against the dark, and not be in danger of obscuration by a background of similar distinctness. The use of two movable arms, each provided with a row of incandescent lights, is already in use in navies, and even with comparatively short lines of light, their position is legible by the unaided eye at a considerable distance. Signalling systems would be simplified, not complicated by such a change, as the symbols would be the same as those now used by day. We should be freed from the treachery of the color sense, the confusion of signals by smoke, fog, and so on, and would, above all, have a system by which danger would be indicated as clearly and unmistakably as safety. The symbols would be distinct from the usual lights of the window or the street, and thus remove another factor of insecurity. The comparative frequency of degrees of

color blindness incompatible with safe railroading, and the difficulty of their detection, are added reasons for the suggested change.

P. H. F.

ON DISTURBANCES OF THE COLOR SENSE IN INTERNAL DISEASES.—HILBERT, R. SCHMIDT (*Klinische Monatshefte für Augenheilkunde*, 1908, xvi, 1, p. 256), collected from literature and his own observations the cases of disturbances of the color sense in internal diseases:

Fifteen cases of erythropsia, of which 5 occurred in neurasthenia, 3 in hysteria, 2 in general paresis and 1 in each of the following affections, epilepsy, chorioiditis, atrophy of the optic nerve, anemia, hematemesis from interstitial hepatitis.

Twenty-two cases of xanthopsia, viz.: 3 in neurasthenia, 1 in epilepsy, 2 in helminthiasis, 2 in icterus, 1 in insolation, 1 during menstruation, 3 in hemeralopia, 2 in influenza, 1 in diabetes, 1 in concussion of the brain, 1 in typhoid, 1 in otitis media, 1 in Weil's disease, 1 in arteriosclerosis. Here Hilbert remarks that the old Hindus were familiar with the yellow vision of icteric persons.

Twelve cases of kyanopsia: neurasthenia 4, hysteria 1, atrophy of the nerve 1, nephritis 1, coryza 1, malaria 1, arteriosclerosis 1, influenza 1, apoplexy 1.

Sixteen cases of chloropsia: neurasthenia 3, tabes 2, chorioiditis 2, nephritis 2, prolapse of iris 1, hemiçrania 1, syphilis 1, paresis 1, epilepsy 1, sympathetic ophthalmia 1, psychosis 1.

Four cases of ianthinopsia: otitis media 1, chorioiditis 1, tabes 1, influenza 1. The enumerated disturbances occurred in different forms. Either the whole visual field appeared in one color, or the sensation was perceived in colored scotomas or was of hemianopic character. In the majority of cases, in 44 out of 71, the phenomenon was due to diseases of the nervous centers and Hilbert concludes that also in affections of other organs it had a central cause and is to be considered as a kind of hallucination of color.

C. Z.

RAILWAY ACCIDENTS AND THE COLOR SENSE. STUDENT, PROF. GEORGE M. (*Popular Science Monthly*, March, 1908), points out the danger of "white" light signals being mistaken for window-lamps, etc. When green comes dimly to the eye, particularly if coming through smoke, and when sight has grown accustomed to the dark, it does not appear green at all, but a pale and ambiguous light that is indistinguishable from white. More

than one instance has occurred where the failure to observe a "distant" or "caution" signal, which is often green, has been a large part of the cause of fatal accidents. But the core of the present system is red. A ruby glass placed before a semaphore lamp, by cutting off the green, blue and violet rays, leaves the light often about one-fifth as intense as when the red glass is removed. Thus, in a cluster of remote signal lights, the white lights usually far outshine the red, the sign of danger. If in the laboratory a "white" semaphore light was reduced in brightness to where in the darkness it could just be perceived, and a railway ruby glass placed before it, the very least increase in brightness at which it could be observed was fourteenfold. Under ordinary conditions an increase of thirtyfold has been necessary before any conscious impression of the light was made through the red glass. A man who had passed the color tests required it to be increased seventy times in order to perceive it. The intensity of light which in some other colors is sufficient to make an impression, does not in red penetrate the mind, yet, all things considered, it may be the best color sign for danger. The spatial character of objects such as shape, position, and especially movement, are more naturally and quickly noted than the color. Although there may be some disadvantages, the writer believes that an effective and safe system of signals might consist of a row of lights,—e. g., imagine incandescent lights inserted in the signal arm used by day, lengthened and otherwise modified. Though a considerable distance be between lights, yet they appear as a continuous line. Experiments show that the main directions of such a line can be caught by the normal eye when the length is about a thousandth of the distance from which it is to be read. Such a system is used in the navy. Two movable arms, each provided with a row of incandescent lights, here rapidly convey, by the direction in which they point, their message from ship to ship, or to the shore. Numerous instances of those defective in color sense having successfully passed the color tests are recorded.

M. D. S.

A CHROMATIC ILLUSION DUE TO A DEFECT OF THE NORMAL EYE.—MICHAUD, PROF. GUSTAVE (*Current Literature*, February, 1908), describes a serious defect invariably present in the normal eye. It may be detected by means of a card with a slit nearly one inch long, the upper and lower halves of the slit being covered by red and blue glass respectively, which is held about a foot from the eye and in the middle of the field of vision, and

another card containing two pin-point holes one-eighth inch apart, which is held in contact with the eye. Two luminous red slits and only one blue are perceived. The same is true on inverting the card containing the slit. This is due to defective achromatism, on account of which the eye does not bring red and blue rays to one and the same focus. If the card bearing the slit is placed at much less than one foot from the eye, two blue slits, much closer together than the red ones, will be perceived. The details of this chromatic illusion are illustrated by diagrams. M. D. S.

VITREOUS.

ON THE VISIBLE REMAINS OF THE VITREOUS CORD.—CHURCH, BURTON, Philadelphia (*Ann. Ophthalm.*, October, 1907). Four cases are reported in which remains of the hyaloid artery persisted. Vision was not disturbed except in one case. M. B.

VASCULAR MEMBRANE IN VITREOUS.—MENZIES, J. ACWORTH, Rochdale (*Ophthalmoscope*, March, 1908). A woman of 54 years presented in left eye a vascular tree arising from the inferior temporal artery which coursed in the vitreous through a delicate transparent membrane. V. = 5/xxiv. M. B.

Book Reviews.

Bier's Hyperemic Treatment in Surgery, Medicine, and the Specialties. A Manual of Its Practical Application.—MEYER, WILLY, M.D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital; Attending Surgeon to the German Hospital; Consulting Surgeon to the New York and Cancer Hospital, and to the New York Infirmary, and SCHMIEDEN, PROF. DR. VICTOR, Assistant to Professor Bier, University of Berlin, Germany. Illustrated. \$3.00 net. W. B. Saunders Company, Philadelphia and London. 1908.

In this book of two hundred pages, only a page and a half is devoted to the indications and uses of hyperemic treatment in eye diseases. The authors recommend obstructive hyperemia, by means of neck bands as well as with the help of suction glasses in the following diseases: progressive optic atrophy when not too far advanced; in acute dacryocystitis; in parenchymatous keratitis; in inflammatory diseases of the eyelids and conjunctiva, and perhaps in sympathetic ophthalmia.

In the treatment of a sty, the authors advise the use of a suction glass connected with a manometer. In obstinate cases of hay fever the authors report good results by the wearing of an elastic neck band.

The aim of Bier's hyperemic treatment is to increase the beneficent inflammatory hyperemia resulting from the fight of the living body against invasion. Hitherto it was considered our duty to fight every kind of inflammation, but Bier teaches just the opposite, viz., to artificially increase the redness, swelling and heat, three of the four cardinal symptoms of acute inflammation.

Bier is opposed to the use of ice-bags at the time of a beginning inflammation.

The three methods by which hyperemia may be produced are: First, by an elastic bandage or by means of cupping glasses, these resulting in a passive or venous hyperemia; second, by means of hot air, causing active or arterial hyperemia.

The advantages of the hyperemic treatment over other methods are:

1. Suppression of the infection.
2. Avoidance of suppuration in many cases.
3. The possibility of using small instead of large incisions in cases in which suppuration has already set in.

4. Hastening the course of the pathologic process.
5. Favoring absorption.
6. Diminution of pain.
7. Its wide field of usefulness.

This new and fascinating treatment deserves further consideration by all ophthalmologists and should stimulate research in this new therapeutic field. The results obtained will be received with great interest.

GUSTAVUS I. HOGUE.

Manual of Ophthalmic Operations.—MAYNARD, F. P., F.R.C.S., Lieutenant-Colonel, Indian Medical Service, Professor of Ophthalmic Surgery, Medical College, and Ophthalmic Surgeon, Medical College Hospital, Calcutta; Fellow of the University of Calcutta. Thacker, Spink & Co., Calcutta. Price, 9s. net, \$2.25.

Here is a book from the antipodes voicing the fact that the human eye is much the same there as it is here, and that the practice of ophthalmologists throughout the world does not greatly differ. We find the familiar asepsis and antisepsis in the preparation of the patient and instruments. The former is confessedly an Indian, as shown by descriptions and illustrations. As the white race is so much in the minority in India, it is probable that a white patient is an exceptional one in the clinics of public hospitals. The author operates with the patient's head toward him, and a good many of his cuts are shown upside down—an unusual method. He also designates the front of the cornea as a clock or target, giving a diagram of the eye with numbers on the cornea corresponding to the hours, defining the position of the puncture, counterpuncture, etc., in operations. This is the English system—the one taught in India, and possibly of considerable assistance in teaching the East India student.

The ordinary operations are well described. Of particular interest is the description of Colonel Herbert's wedge-shaped excision of the corneal limbus and button-hole iridectomy in glaucoma. Subconjunctival discission of soft cataract is recommended as giving less likelihood of infection. Linear extraction is to be accompanied by irrigation of the anterior chamber; dionin is recommended for Descemetitis. A discussion of the advantages of simple or combined extraction with a small iridectomy is decided in favor of the latter.

Expression of cataract (Smith's operation) is practically reserved for over-ripe and unripe cataracts. "Where no selection is made, the visual results are no better than extraction, and not as good as the average." "No operation, however, should be judged by its best results, but by its average, and that, too, in the hands of the average

ophthalmic surgeon. So judged, extraction will hold its own, and for beginners there can be no question: expression is no operation for them. When they can extract with an average of about 5 per cent. vitreous prolapses, they may feel confident to justify their attempting expression—suitable cases even then, it should be added—after seeing the operation performed by some one who can do it. By adopting expression for unripe and over-ripe cataracts, in which extraction is at its worst, the average results will be much improved, and in unripe cases long periods of weary waiting will be cut short."

"The eye is prepared in the usual way, and a speculum inserted. Smith uses one with a weak spring and no screw stop. Grasping the conjunctiva in the middle line below the cornea, Graefe's knife is made to puncture the cornea at 3 and 9 o'clock, i. e., across the center of the pupil. It is inserted through the sclero-corneal junction just as deep as anatomy and experience teach us will avoid wounding the dangerous area, and cut out in the cornea with a sweep half-way between a normal pupil and the sclero-corneal junction." (The reviewer has done the expression operation twenty-two times in the past two years and prefers a regular corneo-scleral-conjunctival flap incision.)

The author says striped keratitis is met with occasionally (but clears up without trouble) and delayed union where the incision is made through the clear cornea, but where a conjunctival flap is made it is unknown. (The reviewer's experience.)

Prolapse of vitreous occurs in 6.8 per cent. (Smith) to 40 per cent. in others, varying with the different operators, and is less the greater their experience of the operation and the better the training of their assistants. Slowness of expression helps to reduce the number of vitreous prolapse. (I do not note any reference to the conjunctival suture after vitreous prolapse. I have this always ready and consequently use it with the result that I have lost no further vitreous or eye by suppuration in the last fifteen years at least.—Reviewer.)

The descriptions of other operations are not different than we find in well-known text-books. Extirpation of the lacrimal sac is well described and is evidently frequently performed in India.

Six double photographic stereoscopic plates of the various steps of the operation for cataract and extirpation of the lacrimal sac are shown and are noteworthy. There are ninety-seven other illustrations. It is certainly a very useful little book, not describing all but the commoner operations, is up-to-date and an acquisition for the ophthalmic student and practitioner. H. V. WÜRDEMANN.

Text-Book of Medical Physics.—BORUTTAU, H., PROF., Berlin. "Lehrbuch der medicinischen Physik fuer Studierende und Aerzte zur Ergaenzung jedes Lehrbuches der Experimentalphysik. 282 pp. with 127 illustrations. Leipzig. Verlag von Johann Ambrosius Barth. 1908. Cloth. 9 M. \$2.25.

The object of this book is to briefly discuss in elementary fashion the facts and theorems of physics as far as they have a bearing on the whole of medicine, particularly the daily increasing special cases of their applications in medicine. With due consideration of the well-known aversion of medical students to mathematics, the mathematical treatment is rather suppressed, and wherever feasible, supplanted by examples or constructions. The author designates his book as "real, more experimental than theoretical, medical physics in which he avoided all physical bases of biological facts without special interest to medicine, comparative physiological arguments, etc., and as a supplement to any text-book of physics."

In the introduction, physiology is defined as physics and chemistry of living organisms, and, referring to the enlightening influence of physical chemistry, it is emphasized that there is no mere physical or mere chemical standpoint in the scientific methods of organic science and medicine. Then the measuring methods, their errors and exactness, graphical registration, orthodiagraphs, etc., are discussed.

The subject proper is divided into mechanics of solids, liquids, gases, accoustics, heat and thermodynamics, magnetism and electricity, and optics. The contents of each paragraph are plainly indicated by larger prints, and the discourse is clear and interesting.

Boruttau has filled by his valuable book an actual gap. It will be extremely welcome to every physician of scientific aims and will elucidate matters to him which he does not find elsewhere. A well-prepared table of contents and indices of authors and subjects greatly facilitate orientation in the handsomely gotten up work, which deserves a large circulation. C. ZIMMERMANN.

Injuries of the Eye, with Reference to Accident Insurance.—WAGENMANN, A., PROF., Jena. "Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 130 to 134. 400 pp. with 36 figures in the text. Leipzig, Wilhelm Engelmann. 1908. Subscription 10 M. \$2.50.

This is an entirely new chapter of the great handbook, divided into a general and special part. The bulk of the present numbers is occupied by the general part, commencing with an introduction on the importance of the injuries of the eye, especially for the practicing oculist, the great progress made in their treatment within the

last 30 to 40 years, which was mainly due to antiseptis and asepsis, and the general disposition under which the injuries will be considered, according to the mode of injury. Then come paragraphs on natural protective arrangements of the eye against injuries and their sequelæ, increased exposure of diseased eyes; causes of injuries owing to occupation, accident, carelessness, maliciousness, self-inflicted; statistics of eye injuries; prophylactics, with numerous illustrations of eye protectors; infections of the wound after eye injuries and their morbid agents, cocci, bacilli, moulds; tuberculosis, tetanus, anthrax, malleus, hydrophobia after eye injuries, syphilis, trachoma, and injuries of the eye; influence of traumatism on the development of tumors on and in the eye, neuroses and psychoses after eye injuries.

As the introduction of accident insurance has promoted our knowledge of eye injuries and their consequences by giving the stimulus to numerous scientific investigations and literature, to the benefit of the injured and better estimation of the sequelæ of injuries, and is of great practical importance, especially to surgeons practicing in industrial centers, the author gave it here a greater space, in form of a special essay. One hundred and forty pages are devoted to accident insurance and the economic valuation (including mathematical formulas), of the decreased earning ability in consequence of the damage done through accident, concluding with simulation and aggravation, and injuries of the eye in medicolegal aspects.

In the special part, as far as contained in these numbers, the contusions of the eye are considered, their nature, mechanism, their consequences in the anterior segment without perforation of the outer tunics, the mechanism of indirect rupture of the chorioid, the corneo-scleral ruptures, and experimental investigations on the injuries of the eye by contusions.

Wagenmann's monograph is a most exhaustive work, with thorough utilization of literature, which will give the best possible information on the important topics mentioned. C. ZIMMERMANN.

Text-Book of Ophthalmology.—**TERRIEN**, F., Ancien chef de clinique ophtalmologique à la faculté de Médecine de Paris. Précis d'ophtalmologie. 600 pp. with 275 figures in the text and a preface by Professor de Lapersonne, Paris. J. B. Baillière et fils. 19 Rue Hautefeuille. Paris. 1908. Cloth, 12 fr. \$2.40.

Terrien's book chiefly pursues practical purposes, as especially emphasized in the preface of Prof. de Lapersonne. It commences with the best methods for the semiological examination of the eye,

the determination of vision and refraction, and the study of functional disorders. Particular attention is paid to the difficulties, encountered in injuries of the eye, with an appendage on the regulations for military service. The diseases are treated in a classical manner without complicated formulas or long discussions on pathogenesis, the greatest importance being given to those of the cornea and conjunctiva, as the most common and those that most frequently come under the care of every physician.

The author who in conducting for many years, as chief of the clinic of Prof. Panas, the ophthalmological courses in the Hotel Dieu, was especially enabled to gather great experience in distinguishing the essential from the less important, has imparted this faculty to his book, rendering it a most valuable practical guide, which has our heartiest recommendation. It is very tastefully gotten up and has a very handy form.

C. ZIMMERMANN.

The Changes of the Retina by Light.—GARTEN, S., PROF., Leipzig. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 128 and 129. Pages 129 to 250, with 36 figures in the text and 12 plates. Leipzig. Wilhelm Engelmann. 1908.

These numbers conclude the elaborate chapter of Garten, the first part of which was reviewed in *OPHTHALMOLOGY*, vol. *ii*, p. 387. They contain the changes of preformed pigments by light, especially the bleaching of the visual purple, discussing in detail the general significance of the pigments of the retina and their changes by light, the bleaching of the pigment needles and granules of the retinal epithelium, color of the oil globules and their changes by light, and the purport of the oil globules. Most interesting is the exhaustive discourse on the visual purple from its discovery by Boll up to the most recent researches, its occurrence in animals and the human eye and its regional distribution, the methods of observing it in the living animal and in the isolated retina, its entoptic perception, the chromatic changes of the visual purple by light, illustrated on a colored plate, and by other physical and chemical influences, and its color in various animals. In discussing the question whether visual yellow is a new-formed pigment, the author, after a historical review, records his own investigations which speak for a formation of visual yellow through bleaching of the visual purple. It has been seen in the living eye of the fish, frog, owl and rabbit, whence its occurrence in the human eye is at least probable. Then the regeneration of the visual purple, the influence of the quality of the bleaching light on the color of the retina and the changes of the retina as a whole are considered, as chemical reactions, electromotor actions

of the retina, with Garten's own experiments on the currents in the retina created by impinging light and a synopsis of the various observations and explanations of others.

Garten's essay, adorned with splendidly executed plates and a very complete bibliography, gives a most interesting and lucid exposition of this intricate subject, and is another admirable exhibit of the unsurpassed value of the great handbook.

C. ZIMMERMANN.

Handbook of Human Physiology.—NAGEL, W., PROF., Berlin, in conjunction with many collaborators. Volume IV, 792 pp., with 132 illustrations and 2 plates. Braunschweig. Friedrich Vieweg und Sohn. 1908. 24 M. \$6.00.

This volume contains the physiology of the nervous and muscular systems, commencing with A. Tschermak's elaborate treatise on the physiology of the brain. After an introduction on the general function of the brain, the observations after removal of the brain in different classes of vertebrates, and in human monstrosities without brain, are set forth, showing that in general the lack of functions increases with the higher degrees of organization. Then the phenomena after removal of one hemisphere are described with general conclusions. The historical remarks at the head of the chapter on the functional division of the cortex of the brain point out that the first progress in the localization was the clinical observation of Broca on the disturbances of speech dependent on lesions of the third frontal gyrus, in 1863. The results of experimental irritation of the cortex are discussed with special consideration of the places of irritation for the various muscles and the vegetative sphere in different animals, especially dog and monkey, and in man during operations on the brain, with checking effects, followed by an appendix on sleep. The "experimental lesions of the cortex of animals" deal with the motor and sensitive zones and the cortical fields of the higher senses, with particular attention to lesions of the visual sphere and the parieto-occipital lobes, the spheres of hearing, smell and taste, and the phenomena of restitution and compensation. Then the dates of localization from the pathology of the human brain and from the defects of higher psychic functions receive a very detailed discourse, of which we mention the analysis and localization of the functions of speech, writing, reading, with diagrams, tables and schemata for better illustration, of the musical faculties, mindblindness and the relations of certain parts of the brain to the intellect. The chapter on the tectonic and histologic structures of

the cortex presents the doctrine of Flechsig of the myelogenetic distribution and the tectonic dualism of the cortex, the histologic differentiation of the cortex and the morphology and physiology of the conducting paths of the brain, concluding with a résumé on the dates of localization.

In a similar fashion the physiology of the subcortical ganglia and of the cerebellum is set forth.

In the now following physiology of the spinal cord and medulla oblongata, O. Langendorff gives an introduction on the significance of the central apparatus, the peculiarities of the gray substance, the ganglion cells and the doctrine of neurons and its opponents, and the hypothesis of fibrillæ. Although recent observations may necessitate certain corrections of the prevailing views on neurons, Langendorff sees no sufficient reason to abandon it, and brings further arguments in its favor, especially from the study of reflex phenomena. Under "general central functions" 82 pages are devoted to a splendid exposé of the reflex phenomena, considering in detail their history, definition and characteristics, reflex centers, their creation and conditions, i. e., irritations and their methods, impact, dependence on intensity, conditions of excitability, forms of reflex motion, spreading of excitation and laws of reflexes, their biologic meaning, time of reflexes, inhibition and promotion of reflexes, anatomic bases of the reflex phenomena, followed by chapters on central irradiation of excitation, automatism, spinal and bulbar coordinations, trophic significance of the central organs. Here Langendorff emphasizes that the physiologic experiment does not warrant the assumption that the cerebrospinal central organ exerts specific trophic influences upon the peripheral tissues, as muscles, skin, etc., which in nervous diseases are much more likely owing to paralysis of sensation, coincident vasomotor disturbances and in some cases to neuritis.

The next paragraphs consider in detail the spinal segments, the functions of the spinal and cranial nerves, the relation of the spinal cord and medulla to the various organs and systems of organs, e. g., to the muscles, respiration, circulation, centers of the movements of the digestive, vocal and urogenital apparatus, of secretions, centers of closure of lids, and pupillary movements, and the spinal cord as conducting organ.

The sympathetic nervous system is dealt with in a separate article by P. Schultz, who in his general synopsis illustrates the differences of our views of to-day from those of thirty years ago.

The very able essays on general physiology of the striped muscles

by M. von Frey and of the smooth muscles by R. du Bois-Reymond, show the great changes and progress within the last three decades.

In the section on special movements and physiology of the joints by R. du Bois-Reymond the laws of mechanics are applied to the movements of the body. First the body as a whole is considered during rest, then in free motion and against resistances. The different kinds of articulations and their motions, standing, walking and the various positions of the body connected with these are treated in detail in many subdivisions too numerous to be mentioned.

It would lead us too far to enter here into the fascinating contributions of O. Weiss on the movement of protoplasm and of the vibratory cilia which we heartily recommend for delightful continuous reading.

The remaining 103 pages are occupied by the physiology of the vocal organs by W. Nagel. Nagel shows on how many branches of science and arts, especially philology, phonetics in the widest sense would have to draw. He, therefore, confined himself to the physiology of the vocal organs and vocal sounds, throwing only futile sidelights on speech in a stricter sense. In some general thoughts on the construction of the vocal apparatus, stress is laid on the minimal differences in the formation of the vocal organs themselves of man and animals in comparison to the immense differences in the development of the central functions of speech between them, illustrating the close connection between the high perfection of the human brain and the possession of speech, which, on the other hand, gives the possibility to the attainment of higher intellect. In the special part, the movements of the larynx, palate, pharynx, tongue, lips, their positions in producing certain sounds, and an acoustic analysis of the thus produced sounds are very thoroughly presented, with numerous illustrations, e. g., photogravures of the vocal cords in singing falsetto and chest tone, curves and tables.

After this perfunctory glance on the plenitude of knowledge that forms the foundation of medicine, embodied in this volume, it is scarcely necessary to say of what inestimable value such a great work will be to the physician. The external appearance is, in concordance with the contents, of the superior quality peculiar to the publication of the renowned firm.

C. ZIMMERMANN.

The Development of a Science.—OSTWALD, WILHELM, PROF. "Der Werdegang einer Wissenschaft." Seven popular lectures from the history of chemistry. Second edition. 316 pp. Leipzig. Akademische Verlagsgesellschaft m. b. H. 1908.

This book embodies the material of the lectures held by the cele-

brated author before the Institute of Technology at Boston in 1905 and before the Columbia University of New York in 1906. An exhaustive presentation of the history of chemistry was not intended, but in addressing a larger circle interested in natural sciences, the author followed his conviction that the general laws of historic phenomena are more easily and safely demonstrated by the comparatively simple material of the history of a science than by the complicated structure of universal history. For a better general view, the subject is, as a morphologist would do in studying a body, cut into cross sections, from the juxtaposition of which the whole is easier and more perfectly conceived. These are represented by seven lectures on the elements, the equivalent weights and atoms, the laws of gases and molecular hypothesis, isomeria and constitution, electrochemistry, affinity, chemical dynamics, starting from the Greek natural philosophy and ending with the latest achievements. The lectures, displaying an unusual wealth of knowledge and original ideas, are written in a most fascinating style. Soaring beyond detail but describing the discoveries which led to the formulation of the chief laws, they unroll in large strokes a vivid picture of science and scientific investigators and are not only of highly educational value, but also elate the reader with intense interest. The external appearance, paper and print are superb.

C. ZIMMERMANN.

Handbook of Human Physiology.—NAGEL, W., PROF., Berlin, in Conjunction with Many Collaborators. Volume I, First Half and First Part of Second Half. 608 Pages, with 41 Illustrations. Braunschweig. Friedrich Vieweg and Sohn. 1906. 17 M. \$4.25.

The high merits of Nagel's hand-book, emphasized in our reviews of volumes iii and ii (OPHTHALMOLOGY, 1905, p. 841, 1907, p. 389) are further admirably displayed in the present volume i, which contains the physiology of respiration, circulation and metabolism. The first chapter, on the respiratory movements and their innervation by H. Boruttau, is introduced by a comparative synopsis of the object of those movements, and the physical and anatomic bases of pulmonary respiration, followed by paragraphs on the respiratory muscles, changes of the shape of the body by the respiratory movements, types of respiration, spirometry, pneumatometry and the air passages. Under innervation of the respiratory movements the motor nerves of the respiratory muscles, the center of respiration, the reflexes and regulation of the respiratory movements, apnoea, dyspnoea and asphyxia are discussed.

In the second chapter, on gases of the blood and respiratory in-

terchanges of gases by C. Bohr, a general exposition of the physics of absorption of gases by liquids leads up to their special relations to the blood, lymph normal and pathologic secretions considering in detail O, CO₂, CO, N and Argon. Then the interchange of gases is described, the gas secretions of the lungs and the swimming bladder of the fish and their dependence on the nervous system, the interchange of gases between blood and the tissues, influence of altered composition of the inspired air on the process of respiration, with an appendix on obtaining the gases by evacuation of the blood.

F. B. Hofmann's article on general physiology of the heart and innervation of the heart and blood vessels commences with a very interesting chapter on the automatism of the heart and its parts, in which the author favors the theory of Gaskell and Engelmann of the myogenous origin of the heart's action. Then the irritability, contractility and its rhythmical fluctuations, the conduction of excitation, the various actions of the nerves of retardation and acceleration, and the centers of the regulatory nerves of the heart and their excitation are dealt with, followed by the very important chapter on innervation of the bloodvessels.

Two hundred and twenty-six pages are devoted to an elaborate discourse on the physiology of metabolism by R. Tigerstedt. In his introduction Tigerstedt describes the methods of experiments on metabolism, gives a general view on the ingestion and excretions of the body and how to obtain them, with the final calculations. Then the metabolism during inanition, after introduction of albumen, fat and carbohydrates and various other substances are discussed. Here we find a very interesting chapter on alcohol, which is mentioned as an example of a substance that may have two properties, nutritive and poisonous, with predominance of the latter in this case. The metabolism during physical labor, under varying outside temperature, in individuals of different sizes and ages, the apposition of albumen, carbohydrates, fat in the body, the mineral nutritive substances, as water, Na, Cl, P, Ca, Mg, Fe, are the next topics, closing with a practical chapter on the nutrition of man.

The last essay on animal heat is also by Tigerstedt, and is subdivided into temperature of the human body, topography of formation of heat, loss of heat and protection against it, regulation of the temperature of the body and its centers, regulation of temperature of the new-born and on the economy of heat of poikilothermic vertebrates.

This partial enumeration of subjects may suffice to give an idea of the wealth of material collected in this volume. Due consideration of historical development, general points of view, references to the correlation of phenomena pervade the discourses, which by their interesting arrangement and style invite continuous reading. They deserve nothing but the highest praise. C. ZIMMERMANN.

Letters of Albrecht von Graefe to His Friend Adolf Waldau.—GREEFF, R., PROF., Berlin. "Briefe von Albrecht von Graefe an seinen Jugendfreund Adolf Waldau" From the estate Waldau. 127 Pages. Wiesbaden. Verlag von J. F. Bergmann. 1907. 2.40 M. \$0.60.

These letters, written by A. von Graefe from 1849 to 1862, were arranged and accompanied by connecting remarks by the late Mrs. Waldau, the widow of the friend, and for many years assistant, of von Graefe, and edited by Professor Greeff. Teeming with a spirit of poetry, friendship and cheerful work, they give a splendid picture of the amiable and enchanting nature of Albrecht von Graefe. We receive from them an idea how he worked, traveled and utilized his impressions of other nations and their science, with an aspect of the human side of this eminent man in his younger years. It is a pleasure to read the nicely gotten up book.

C. ZIMMERMANN.

Supplement (Beilageheft) to "Klinische Monatsblätter fuer Augeneheilkunde. XLV, 1907."—Edited by PROF. DR. TH. AXENFELD, Freiburg i. Br., and PROF. DR. UHTHOFF, Breslau. 290 pp., with 14, partly colored, plates, and 22 illustrations in the text. Stuttgart, Ferdinand Enke. 1907.

With 1908 the *Klinische Monatsblätter* has received a further expansion, in order to avoid as much as possible in the future the issue of supplements which had again become necessary for the past year. The abundance of interesting material contained in this splendidly gotten up volume allows of only a brief review.

In the first article on thyroid gland and eye, R. Possek, Graz, discusses clinically and experimentally the influence of tetany on the eye. The constant increase of accommodation, anisocoria and other pupillary disturbances are explained by toxic irritations of the central nervous system. Cataract is attributed to the destruction of the capsular epithelium with subsequent decay of the lens fibers. The proof has still to be furnished whether this cellular death is due to a toxic action. The possibility of development of cataract from strumous degeneration of the thyroid gland and the following changes of its physiological function is rejected.

2. Th. Werneke, Odessa, "Action of Thyreotoxin on the Eye," reports his experimental and anatomo-pathological observations on

rabbits and dogs, viz., anisocoria and changes of the epithelium of iris and ciliary body, i. e., severe iridocyclitis with disturbances of nutrition.

3. A. Bielschowsky, Leipzig, on the reflex character of the ocular movements, a contribution to the symptomatology of paralysis of fixation.

4. F. Best and H. Haenel, Dresden, red, green and snow blindness. The auto-observation of Haenel speaks for Hering's theory of counter colors, not for the theory of three components.

5. Th. Axenfeld and J. Rupperecht, Freiburg, i. Br., the pathology of spring catarrh. From their elaborate histologic investigations, illustrated on eight colored plates, the authors found that in spring catarrh all elements of the conjunctival tissue, blood vessels, supporting stroma, and lymphatic cells are proliferating, the latter not in the form of lymph follicles, but under abundant formation of plasma cells. The sclerotic proliferation of stroma is an essential factor in producing the milk-white diffuse color. Likewise the growths at the limbus are chiefly due to proliferations of connective tissue, that of the epithelium may be only secondary. Light may be one, rather frequent, eliciting moment, but not the actual cause.

6. W. Reis, Bonn, on an atypic aspect of spring catarrh, with remarks on its histo-pathology. The essential points of Reis' investigations will be found under the abstracts of this number of OPTHALMOLOGY.

7. Th. Axenfeld and Rupperecht, remarks on the preceding article, could not confirm the observations of Reis, but recommend further studies of these conditions.

8. A. Elschmig, Prag, clinical contribution to the knowledge of spring catarrh, saw striking results from the application of ichthyol.

9. H. Wintersteiner, Wien, on sarcoma of the chorioid with dialysis of the detached retina, with remarks on the development of necroses in sarcoma of the chorioid.

10. A. von Szily, Berlin, a coloboma of both eye cups, downward and inward, and not in connection with the fatal cleft, in a human embryo, aged about 4 weeks. (From the eye clinic of Prof. Axenfeld.) Besides the normal cleft at the ventral portion of the eye cup, a notch may occur at any place of the anterior segment of the globe. These notches form in connection with the development of the inner ocular vessels from the third to fourth week of pregnancy, and differ from the ocular cleft in two important points: They are due to an arrest of development, and are limited to the foremost portion of the eye cup.

11. G. Lanz, Breslau: To the histology and pathogenesis of sympathetic ophthalmia, reports his histologic examinations of a sympathizing eye and its sympathized fellow at an early stage. The primary seat of the process, perhaps embolic, was in the arterial circulation, while the veins were only secondarily involved. Lenz's findings support the assumption of a metastatic origin of sympathetic ophthalmia.

12. G. Levinsohn, Berlin: To the question of experimental proof of the pupillary centers in the medulla oblongata, gives a critical review of the experimental observations and points out the actual results.

13. A. von Merz, St. Petersburg: Gunshot injuries of the eye. Clinical observations from the Russo-Japanese War, arranged in tabular form. In all observations of von Merz of severe injuries with total blindness of one eye, the other eye remained intact, but its vision decreased immediately to such a degree that sometimes only perception of light remained, with ophthalmoscopic changes. He attributes this to psychical shock, and paralytic expansion of the choroidal vessels with transudation between pigment epithelium and elastic membrane of the chorioid. This causes detachment of the retina and vision may remain destroyed even after absorption, so that no ophthalmoscopic changes are visible. The term commotion of the retina is to be applied only to those cases in which immediately after the injury vision is deteriorated for a short time from the shock.

14. F. Dimmer, Graz: The photography of the ocular fundus. An explanation and defense in the controversy with Thorner.

15. W. Unna, Hamburg: The hemophile influenza bacillus of Pfeiffer as morbid agent of intra-ocular suppurations.

C. ZIMMERMANN.

Answers to Questions Prescribed by Medical State Boards.—LUDY, ROBERT B., M.D., Late Acting Assistant Surgeon, U. S. A.; Lecturer on Pathology of Medicine in Temple College of Philadelphia; Author of "Answers to Questions Prescribed by Dental Boards," "Answers to Questions Prescribed by Pharmaceutical State Boards," etc. 70 pp., with index. Price, \$3.50. John Jos. McVey, Philadelphia.

This is the standard book of questions and answers for persons preparing for a state board examination. I believe it is the original one. It has passed through three editions, the third being carefully scrutinized, corrected, revised and abbreviated and added to by the incorporation of recent examination questions and answers.

The author states that duplication in the various states vary from

30 to 80 per cent. The comprehensive knowledge of these questions and answers will serve excellently in the preparation of future examinations before such boards. Many persons having an adequate knowledge of the subject in which they are tested fail because of their inability to interpret properly the intents and purposes of the questions to be answered by them. To aid in this, as well as to afford a convenient manual for the general preparation of medical students in their work, is the sole object of this book.

II. V. WÜRDEMANN.

State Board Questions and Answers.—GOEPP, R. MAX, M.D., Professor of Clinical Medicine at the Philadelphia Polyclinic; Assistant Visiting Physician to the Philadelphia General Hospital. 684 pp., with index. Price, \$4.00. W. B. Saunders Company, Philadelphia and London.

This is the most exhaustive compilation of state board of examiners' questions and the most complete and correct answers that has been published, and is of the utmost value for physicians preparing for state board examinations. In contradistinction to some of the other publications, there is order in the arrangement of the questions, the continuity of the subject being maintained. For older practitioners especially, owing to the exhaustive type of the state board questions, it is absolutely necessary, and even for the best informed physician, to make special preparation in order to pass these stringent examinations, and for this purpose books of this character are essential.

Even the author of an essay on any special technical subject may at times find it difficult to give a satisfactory and more especially a complete answer off hand to questions that may be asked considering the subject. When a candidate for license looks at these questions and answers without preparatory study he may be at first dismayed at his prospects, but after careful study and following the plan of the answers in this book of Goepp's he will find that the subject and the facts will come back to him and he will be able to pass the necessary percentage.

The author has been assisted by a number of other physicians in the preparation of answers to the questions which were selected from those asked during the past four years. The list is exhaustive of the kind of examination questions usually propounded by state boards. The exhaustive index of 51 pages is particularly useful in the study of this book. It is somewhat smaller print than Ludy's and containing possibly 25 per cent. more questions and answers.

H. V. WÜRDEMANN.

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